SOCIAL PROVISIONS IN THE EXERCISE SETTING

A Thesis Submitted to the College of

Graduate Studies and Research

in Partial Fulfillment of the Requirements

for the Degree of Master of Science

in the College of Kinesiology

University of Saskatchewan

Saskatoon, Saskatchewan

By

Jocelyn Dawn Watson

PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a Postgraduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work, or in their absence, by the Head of the Department or the Dean of the College in which my thesis work was done. It is also understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis.

Requests for permission to copy or make other use of material in this thesis in whole or part should be addressed to:

Dean of the College of Kinesiology
University of Saskatchewan
Saskatoon, Saskatchewan S7N 5B2

ABSTRACT

Social support has been recognized to impact positive health behaviours, including exercise participation. In the exercise domain, one conceptual framework that has been employed to examine social support is Weiss's (1974) Model of Social Provisions. The main purpose of the present study was to utilize Weiss's (1974) model to examine how the social provisions relate to university students' energy expenditure while exercising with others. Specifically, this study was concerned with participants' perceptions about the availability of social provisions, their preferences for the provisions in the exercise setting, and the congruence between social provision perceptions and preferences as they related to energy expenditure. Participants who had performed exercise with others in the past 4 weeks (N=201) completed the Modifiable Activity Questionnaire (MAQ; Kriska et al., 1990) to assess energy expenditure, as well as modified versions of the Social Provisions Scale (Cutrona & Russell, 1987) to assess social provision perceptions and preferences. Results from exploratory factor analyses revealed separate five-factor models for both the perceived provisions (i.e., attachment, reliable alliance, social integration, opportunity for nurturance, and reassurance of worth) and the preferred provisions (i.e., guidance, social integration, reliable alliance, reassurance of worth, and opportunity for nurturance). Discriminant function analyses were used to assess the unique contribution of these perceived and preferred provisions to participants' energy expenditure. The results from the analyses indicated that none of the perceived provisions and none of the preferred provisions predicted high versus low expenditure, nor did the congruence relationship between the perceived and preferred variants of each provision predict high versus low energy expenditure. Potential

explanations for the non-significant findings were highlighted with respect to study methodology. Directions for future research were also discussed.

ACKNOWLEDGEMENTS

I am indebted to all those individuals who have helped make this research possible. First and foremost, I must extend a sincere thank-you to Dr. Kevin Spink for giving me the opportunity to pursue graduate studies at the University of Saskatchewan. You have been a wonderful mentor and I am grateful for your guidance, encouragement, and input during this project.

To Kathleen Martin Ginis, I thank you for introducing me to and sparking my interest in the field of health and exercise psychology. You have inspired me in so many ways, and I cherish your continued kindness and support.

To my committee, I sincerely appreciate your invaluable role in the preparation of this thesis. To Dr. Keith Russell and Mark Bruner, thank you for allowing me to collect data in your classrooms. And, to the College of Kinesiology and the Social Science and Humanities Research Council of Canada (SSHRC), I acknowledge your financial assistance over the last two years.

Thank you to my fellow graduate students, and in particular to Kathleen Wilson, for keeping my spirits up throughout the duration of this project with your advice, patience, and friendship.

Finally, I am grateful to my family and friends, as this project would not have been possible without your support.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

1.1 Introduction

The myriad of health benefits associated with physical activity has been well documented (Nieman, 1998). Participation in regular physical activity throughout the lifespan has been identified as being important for maintaining and enhancing physical and psychological health (USDHHS, 2000). As examples of the link between physical activity and positive health outcomes, physical activity has been associated with increased muscular strength and endurance (Winett & Carpinelli, 2001), maintained and/or improved bone density (Bailey, Faulkner, & McKay, 1996), reduced body fat (Slentz et al., 2004), and enhanced psychological well-being (Plante et al., 2003). While most people recognize that regular physical activity has a beneficial impact on their health, less than half of adult Canadians are sufficiently active to achieve these health benefits, making physical inactivity a major health issue in Canada (Craig & Cameron, 2004).

In addition to the impact that physical activity has at an individual level, promoting physical activity also has the potential for considerable financial impact in terms of reduced governmental health care spending (Health Canada, 1998). It has been noted that physical inactivity increases the incidences of at least 17 unhealthy conditions, almost all of which are chronic diseases or risk factors for chronic diseases, which contribute significantly to health care costs to society (Booth et al., 2000). Using the example of coronary heart disease in Canada, it has been estimated that each one

percent increase in the number of individuals who are physically active would reduce treatment costs for ischemic heart disease by over $10 million annually (Conference Board of Canada, 1996). This reduced burden to the healthcare system is highly significant considering that exercise levels in Canada are low.

Given the beneficial health outcomes and the economic spin-offs of physical activity, it may not be surprising that physical activity has been called "today's best buy in public health" with regard to disease conditions such coronary heart disease (Morris, 1994). Further, when these demonstrated health and economic benefits of physical activity are coupled with evidence that physical activity is a modifiable risk factor associated with multiple chronic conditions, credence is provided for recent public health initiatives in Canada and the United States that have made the promotion of physical activity a top priority (e.g., Physical Activity Benchmarks, Healthy People 2010).

An example of a long-running physical activity promotion campaign was ParticipACTION, which ran in Canada from 1971 to 2001 (Edwards, 2004). The goal of this media-based campaign was to increase public awareness about physical activity, transfer information about the benefits of physical activity, and set a social agenda for increased physical activity participation in Canada (Baumann, Madill, Craig, & Salmon, 2004). Although the ParticipACTION campaign has been recognized as a successful initiative (Lagarde, 2004), it is clear through this effort and others (e.g., Bauman, McLean, et al., 2003; Hillsdon, Cavill, Nanchahal, Diamond, & White, 2001) that the provision of health information alone is not sufficient to improve long-term physical activity participation (Kemper et al., 2002). Evidence suggests that the key to improving physical activity behaviour is highly dependent upon a number of factors including

individual motivation, social influences, and environmental conditions (Nahas, Goldfine, & Collins, 2003).

Because some individual motivation and environmental factors (e.g., weather, access to facilities, etc.) may be difficult to change, the role of social influences may be an appropriate variable to be targeted when designing effective exercise[1] interventions (Carron, Hausenblas, & Mack, 1996). Moreover, a large body of literature suggests that social influences, namely social support, play a pivotal role in determining an individual's exercise behaviour. Almost every study that has examined the relationship between exercise and social support has found a strong positive association (Stahl et al., 2001). Specifically, individuals who have positive support for exercise from family members and friends tend to engage in more exercise (Carron et al., 1996). By contrast, individuals who lack social support from family and friends tend to have lower levels of exercise. A recent study by Gyurcsik, Bray, and Brittain (2004) reported that, among a sample of students transitioning from high school to their first year of university, lack of social support represented an important barrier to exercise participation.

Given the positive impact of a physically active lifestyle on a multitude of health outcomes, there is a need to understand how to effectively promote exercise. In terms of promoting a physically active lifestyle, there are a number of populations that are worth targeting. However, one group that is of interest is first-year university students. There are a number of reasons for focusing on this population. For one, the first year of postsecondary studies is marked by transitions and adjustments to the demands of

[1] As compared to the more general concept of physical activity, exercise refers specifically to a planned program of physical activity geared toward achieving or maintaining health and physical fitness (Caspersen, Powell, & Christenson, 1985). Exercise, rather than physical activity, will be the focus of the remainder of this paper.

university life that can further disrupt exercise participation (Bray & Born, 2004). Second, university-aged individuals are at particular risk for developing a sedentary lifestyle given that exercise participation declines dramatically during the teenage and young adult years (Caspersen, Pereira, & Curran, 2000). It has been reported that less than half of first-year university students are vigorously active and more than 30% become inactive in their transition to university, despite being active in their final year of high school (Bray & Born, 2004). Third, because exercise patterns established during adolescence and young adulthood may be a critical determinant of exercise in one's later years (Seefeldt, Malina, & Clark, 2002), the university-aged population is an important target group for conducting exercise research (Leslie, Sparling, & Owen, 2001). Fourth, given that individuals of this age have previously reported that a lack of social support is a barrier to their participation in regular exercise (Gyurcsik et al., 2004), investigating how the impact of social support could potentially enhance exercise levels in this population is a worthy research pursuit.

The following sections will provide an in-depth theoretical and empirical examination of the construct of social support, with a particular focus on social support in the exercise domain.

1.2 Literature review

1.2.1 Social support

People across all ages and cultures have the ability to form social bonds. Studies have demonstrated that proximity can be a potent factor in relationship formation (e.g., Festinger, Schachter, & Back, 1963). Evidence also suggests that when individuals confront a stress-inducing experience, the mere presence of other people can be

comforting, even if these people are strangers (Schachter, 1959). Schachter (1959) compared participants who thought they were going to experience a series of painful electrical shocks and participants who thought they would experience only mild electrical stimuli on whether they preferred to (1) wait alone or (2) wait with other participants for a brief period while the final preparations for the experiment were made. The results of this study showed that, although all participants preferred to wait with others, the more painful the anticipated situation, the more likely participants were to choose to wait with others. Baumeister and Leary (1995) have hypothesized that the need to form and maintain strong, stable interpersonal relationships is a fundamental human motivation. Given this supposition, it should not be surprising that interpersonal interactions can have a strong impact upon one's cognitions, emotions, and behaviours (Baumeister & Leary, 1995).

In terms of cognitions, interpersonal relationships have been demonstrated to be a powerful factor in shaping human thought. For example, individuals tend to interpret others with whom they have a relationship as more favourable. Similarly, group membership may also bias cognitive patterns by producing group-serving attributions that place group members in a positive light (Zander, 1971). Interpersonal relationships also have been reported to produce strong emotional responses. The presence of stable bonds is responsible for an abundance of positive affect (e.g., feeling good), but threats to these social attachments can also be a primary source for negative affect (e.g., anxiety, jealousy; Baumeister & Leary, 1995). In general, Baumeister and Leary (1995) have suggested that being accepted and included leads to a variety of positive emotions, whereas being rejected or excluded leads to potent negative feelings. Further, social support has been related to enhanced psychological well-being through its effects on

positive affect and self-esteem (Schlenker & Britt, 2001). Finally, interpersonal relationships can affect positive behaviours such as smoking cessation (Lichtenstein, Glasgow, & Abrams, 1986) and exercise (Carron et al., 1996), as well as negative behaviours such as crime (Sampson & Laub, 1993) and suicide (Trout, 1980).

Social relationships not only play a central role in people's everyday lives, but they also have been implicated in health. While the importance of social relationships vis-à-vis health began as early as the late 19th century (e.g., Darwin, 1872/1965; Durkheim, 1897/1951), the construct of social support was not conceptualized until much later. Specifically, social support is based on positive interactions with others (Baumeister & Leary, 1995). Two seminal papers in the mid-1970's by Cassel (1976) and Cobb (1976) spawned considerable interest across academic disciplines to study in the area of social support and health. Cassel (1976) took an epidemiological perspective, emphasizing the social environment and how the presence of others can act as a buffer against an individual's susceptibility to disease. Cobb (1976) was interested in the buffering effects of social support from a medical standpoint, recognizing that strengthening individuals' social support networks was the best way to provide protection from pathological states. Although there continues to be strong interest in the study of social support across a number of disciplines (e.g., epidemiology, medicine, community and clinical psychology, sociology; Sarason, Sarason, & Pierce, 1990), perspectives are varied regarding the social support construct itself. Across the various domains that have an interest in social support, conceptualizations differ widely (Leppin & Schwarzer, 1990).

1.2.2 Conceptualizations of social support

Theorists have yet to agree on a concrete definition for social support. A general description put forth by Wallston and colleagues (1983) stated that social support represents "the comfort, assistance, and/or information one receives through formal or informal contacts with individuals or groups" (p. 369). A large number of definitions of social support have been formulated and reflect a wide variety of viewpoints; however, most typically, the conceptualization of social support has been approached from two major perspectives: structural and functional.

Structural support assumes that the *quantity* of established social connections an individual has is important and is not concerned with the *quality* of existing relationships (Sarason & Sarason, 1994). This presents a simplistic conceptualization of social support, given that it is operationalized only in terms of variables such as the presence of a spouse, the frequency of contacts with friends and family, and the number of such relationships (Sarason & Sarason, 1994). While these types of observations (of social network size, for instance) offer a quantitative assessment of social support, they do not directly address the specific characteristics of support relationships, and therefore provide no information about the quality of social support (Antonucci & Johnson, 1994). Consequently, the general consensus is that this unidimensional conceptualization of social support has not advanced our understanding of the construct as a whole very much.

In contrast, functional support considers the particular functions that social relationships serve an individual (Stroebe, 2000). Examples of specific functions include providing information, bolstering esteem, and promoting a sense of belonging. More recent approaches have attempted to define social support in terms of the various,

multidimensional functions that relationships can fulfill. Most researchers now agree that it is necessary to go beyond the existence, or lack of, social relations and examine what functions are actually provided or perceived to be present in these relationships (House & Kahn, 1985; Leppin & Schwarzer, 1990).

In doing so, it is recognized that the construct of social support contains a number of facets, such as tangible, emotional, and appraisal components (Cassel, 1976; Cobb, 1976; Weiss, 1974). Tangible support is a non-psychological form of support, and involves behaviours that directly help the person in need, such as providing money, care, or other forms of assistance. Emotional support plays a role in one's feelings of control and self-esteem, and involves providing empathy, care, love, and trust. Appraisal support influences one's perceived ability to cope with a given situation, and involves the transmission of information that is relevant for the person's self-evaluation, such as encouragement or feedback. The ability to investigate social support in terms of its specific components is useful not only in understanding how specific support functions promote health and health-related behaviours, but also in directing the development of effective interventions (Sarason & Sarason, 1994).

A further distinction regarding the functional aspects of social relationships is the difference between received support and perceived support (Dunkel-Schetter & Bennett, 1990). Received support refers to the amount of support that is actually received, and as such, relies on the recall of past events. In contrast, perceived support refers to the perception of support believed to be available if needed. Of the two forms of social support, received and perceived, Sarason and colleagues (Sarason, Sarason, & Pierce, 1990) have argued that the focus on perceived social support fits well with the early conceptualizations of social support by Cassel (1976) and Cobb (1976). Cassel (1976)

contended that the recipient's perceptions about receiving caring and positive regard were most responsible for social support's positive effect on health. Similarly, Cobb (1976) postulated that the beneficial effects of health were a result of the recipient's perceptions that he or she is cared for and valued. Both researchers were concerned about the health outcomes associated with social support as a buffer to stress. As outlined in the next section, this trend to emphasizing perceived over received social support, although contentious in some circles, has been maintained in the current health literature.

1.2.3 Social support and health

A number of reviews have reported social support to be related to positive health outcomes (e.g., Cassel, 1976; Cobb, 1976; Leppin & Schwarzer, 1990; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). For instance, Uchino and colleagues (1996) reviewed 81 studies and found that social support had beneficial effects on aspects of the cardiovascular, endocrine, and immune systems. Moreover, social support has been related to health-promoting behaviours, such as decreased alcohol consumption and cigarette smoking (e.g., Steptoe, Wardle, Pollard, Canaan, & Davies, 1996), as well as increased exercise (e.g., Okun et al., 2003). Despite the positive empirical findings regarding the association between social support and health, one controversial issue that exists in the health-related social support literature is the relevance and impact of received as compared to perceived support (Leppin & Schwarzer, 1990; Sarason, Sarason, & Pierce, 1990).

In recent years, the accepted approach when considering the association between social support and health has been to distinguish that the perception that others will

fulfill certain functions of support when they are needed is what is essential to positive health outcomes (Leppin & Schwarzer, 1990). One's perception of the social support available is more important than whether or not one actually receives support (Cohen, Gottlieb, & Underwood, 2000; Lakey & Cohen, 2000; Wills & Shinar, 2000). Given that perceived social support availability is known to be of considerable significance for health (Wills & Shinar, 2000), the *perceived* aspect of social support, rather than the *received* aspect, was chosen to provide a theoretical lens for this study.

1.2.4 Model of Social Provisions

Given that the focus of the present study was on perceived support, it was critical that the theoretical approach taken be in line with this focus. There are a number of conceptual frameworks that correspond with the notion of perceived support (e.g., Cohen, Mermelstein, Karmack, & Hoberman, 1985; Sarason, Levine, Basham, & Sarason, 1983; Vaux, Riedel, & Stewart, 1987). Despite semantic differences, these models tend to identify similar dimensions of support within their conceptualizations. For example, Cohen and colleagues' (1985) Interpersonal Support Evaluation List (ISEL) contains subscales for appraisal support, instrumental support, companionship support, and esteem support. The Social Support Behaviors Scale (SS-B; Vaux et al., 1987) has five subscales termed emotional support, practical assistance, financial assistance, advice-guidance, and socializing. Finally, Weiss's (1974) Model of Social Provisions describes six social provisions that may be obtained from social relationships: reliable alliance (tangible assistance); guidance (advice or information); attachment (emotional closeness); social integration (a belief of common interests and concerns); opportunity for nurturance (a sense of being relied upon by others); and reassurance of

worth (recognition of competence and value). Like the ISEL and SS-B, the Model of Social Provisions contains both assistance-related provisions (i.e., guidance and reliable alliance) and non-assistance-related provisions (i.e., attachment, social integration, opportunity for nurturance, and reassurance of worth). Assistance-related provisions refer to those that represent functions relevant to problem solving. Non-assistance-related provisions do not relate directly to problem solving, but instead have effects that are mediated by cognitive processes (e.g., self-efficacy, attribution processes).

The Model of Social Provisions (Weiss, 1974) was selected as the theoretical underpinning for the present study for three reasons. First, as mentioned previously, the focus of this investigation was on individuals' perceptions of the social support available. It was therefore important to incorporate a theoretical framework that would tap into perceived support (rather than received support), as this model does. As well, because the Model of Social Provisions incorporates six varying, but theoretically interrelated, dimensions of social support, it is thought to address the functional nature of perceived support by offering insight into the specific ways that each dimension potentially operates in a given context (Sarason & Sarason, 1994). In short, it presents the opportunity to test the various dimensions of support for their usefulness in dealing with particular types of challenges (e.g., physical inactivity). This echoes Weiss's (1974) contention that different provisions might be more crucial under certain circumstances. This is important because understanding which dimensions of social support are most relevant in certain situations or contexts (e.g., exercise settings) may serve to inform future intervention efforts.

Second, this model has been used in previous exercise studies (e.g., Duncan, Duncan, & McAuley, 1993; Fraser & Spink, 2002). One exploratory study has been

conducted qualitatively examining the possible relationship between exercise motives and the support provisions in Weiss's (1974) model with the age group of interest in the present study (i.e., first-year university students; Watson, Spink, Wilson, et al., 2003). Participants were asked in an open-ended approach to list reasons why they exercised with others. Of the responses given, more than half could be classified as one of the six social provisions. There is also quantitative evidence to support the utility of this model in the exercise domain with other age groups (e.g., Duncan, Duncan, et al., 1993; Fraser & Spink, 2002). Duncan and colleagues have conducted a series of studies using the Model of Social Provisions with a sample of middle-aged adult exercisers. This line of research demonstrated that certain provisions (e.g., reliable alliance, guidance, reassurance of worth, and attachment) do relate to forms of exercise participation. Given that Watson et al.'s (2003) findings point to the relevance of the Model of Social Provisions (Weiss, 1974) in the university population, this study aimed to extend the quantitative application of the model in the exercise domain by examining first-year university students.

Third, with respect to quantitative assessment, a measurement tool that evaluates the perceived existence of the six social provisions in Weiss's model already exists. The Social Provisions Scale (SPS; Cutrona & Russell, 1987) was developed based on Weiss's (1974) Model of Social Provisions, and it has been demonstrated to be valid and reliable in the exercise setting. For example, one study with middle-aged adults reported internal consistency values (i.e., Cronbach's alpha) as ranging from .62 to .95 for the six provision subscales across four measurement periods (Duncan, McAuley, et al., 1993), thereby indicating adequate inter-item scale reliability (cf. Nunnally & Bernstein, 1994). Another study by Courneya and McAuley (1995) assessed the discriminant validity of

social support (as measured by the Social Provisions Scale; Cutrona & Russell, 1987) in comparison with subjective norm and group cohesion constructs. Results from this study revealed that social support was independent of both subjective norm and group cohesion.

One advantage to using this instrument is that it makes it possible to assess the six provisions independently. It has been recognized that the subscales of some social support instruments are highly correlated (e.g., Sarason & Sarason, 1994). This would suggest that the subscales might not be assessing the different functions of social support, which would be highly problematic in this study. However, when the SPS has been used in an exercise setting in the past, this has not been a concern. In fact, confirmatory factor analyses of the SPS revealed a six-factor structure that corresponded with the six social provisions outlined by Weiss (Duncan & Stoolmiller, 1993).

1.2.5 Social support and exercise

Much of the social support research in the health area assumes that social support is a primary factor in the maintenance of health-promoting behaviours (Duncan et al., 1993). Exercise is recognized as one such health-promoting behaviour. It has been suggested that the support of family members, friends, and important others are significant components in adopting and adhering to exercise (Carron, Hausenblas, & Mack, 1996).

In the exercise setting, social support has been associated with a number of outcomes, including adherence to an exercise program (e.g., Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993), compliance to an exercise program (e.g., Fraser & Spink, 2002), frequency of exercise participation (e.g., Okun et al., 2003; Steptoe et

al., 1997), and energy expenditure (e.g., De Bourdeaudhuij, Sallis, & Vandelanotte, 2002; Dowda, Ainsworth, Addy, Saunders, & Riner, 2003; Leslie et al., 1999; Rovniak, Anderson, Winett, & Stephens, 2002). In terms of adherence, Duncan and colleagues (Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993) found that social support provisions were able to discriminate between adherers and non-adherers to a prescribed exercise regimen. Specifically, individuals who perceived more social support were more likely to remain to adhere to the exercise program. In terms of compliance, Fraser and Spink (2002) conducted a similar study with individuals who were instructed by a healthcare practitioner to participate in a clinical prevention and rehabilitation exercise program. Their findings revealed that higher levels of social support predicted better compliance behaviour.

In addition to those studies that have examined ongoing exercise programs, there are also a number of studies that have looked more generally at participants' overall exercise participation. Across these studies, relationships have been established between social support and a variety of operationalizations of exercise, such as whether or not participants perform any form of exercise (Stahl et al., 2001), frequency of exercise participation (Okun et al., 2003; Steptoe et al., 1997), and energy expenditure across a specified time period (De Bourdeaudhuij et al., 2002; Dowda et al., 2003; Leslie et al., 1999; Rovniak et al., 2002).

Of these outcomes, a measurement of energy expenditure has the advantage of allowing participants to be classified as sufficiently or insufficiently active for potential health benefits based on the frequency, duration, and intensity of their exercise bouts (cf. Cameron & Craig, 2004). In contrast, a measure of frequency or attendance does not assess the individual's level of physical exertion because there is no indication of the

duration or intensity of the exercise bout. However, even though one cannot assume that attendance and energy expenditure outcomes are analogous, it would be expected that individuals who attend more physical activity bouts are likely to have higher energy expenditure. Therefore, in examining energy expenditure as an extension to other studies that have examined measures of attendance not only provides a base for comparison, but it also makes it possible to compare individuals who are physically active at a level sufficient for health-related benefits versus individuals who are not sufficiently active for health benefits. As such, a measure of energy expenditure was selected as the means of assessing exercise. The examination of energy expenditure in this study is also comparable to other studies because it assessed kilocalories expended per kilogram of body weight per day (e.g., De Bourdeaudhuij et al., 2002; Dowda et al., 2003; Leslie et al., 1999; Rovniak et al., 2002). However, this is the first study to examine energy expenditure in concert with Weiss's (1974) social provisions. Other studies employing Weiss's (1974) social provisions have all operationalized exercise participation as program attendance, adherence, or compliance. Further, in the studies examining energy expenditure, social support has only ever been operationalized as a unidimensional construct (e.g., Dowda et al., 2003; Leslie et al., 1999; Rovniak et al., 2002).

One limitation with many of the social support studies that have used energy expenditure as the main outcome variable is that social support has been examined in a structural manner. That is, social support has been measured by the number of contacts that participants have (i.e., their social network) rather than by the various functions that socially support relationships serve. Of the few studies that have examined the functional components of the social support construct in the exercise domain (e.g., Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002),

exercise participation has always been represented as adherence or compliance behaviour. Therefore, the present study attempted to integrate the two major strengths of previous research in this area by (1) examining the functional nature of social support, and (2) using a measure of energy expenditure to assess activity level, thereby making it possible to identify individuals who may have garnered health benefits from their exercise participation as it relates to social support.

In terms of the functional nature of social support, Dishman (1994) has emphasized the importance for exercise research to be conducted from a theoretical perspective. In the exercise domain, social support is most often examined vis-à-vis Weiss's (1974) Model of Social Provisions. In a series of studies employing the Model of Social Provisions (Weiss, 1974), Duncan and colleagues sought to identify exercise domain-specific provisions of social support. Their research found that specific provisions of support were related to an individual's decision to initiate an exercise regimen (Duncan, McAuley, Stoolmiller, & Duncan, 1993; Duncan, Duncan, & McAuley, 1993). This research focused primarily on individuals who freely chose to participate in the exercise program. However, there are other individuals who participate in an exercise program because they have been instructed to do so by a health-care provider.

To extend the work by Duncan and colleagues in the adherence setting, Fraser and Spink (2002) conducted an investigation in the compliance setting with individuals who were prescribed a clinical exercise regimen and examined two forms of compliance behaviour, attendance and dropout. In terms of attendance, high scores on the reliable alliance provision and low scores on the guidance provisions were related to high

attendance behaviour. In terms of dropouts, high scores on reliable alliance were predictive of graduate versus dropout behaviour.

Given that the work of Duncan and colleagues (1993) and Fraser and Spink (2002) was conducted with middle-aged adults, it was unclear whether the social provisions that emerged in their research would discriminate between highly active and less active individuals of other ages (e.g., youth, elderly). In particular, given the call for research among university-aged samples (e.g., Gyurcsik et al., 2004; Leslie et al., 2001), it was considered fruitful to know whether there are certain provisions that highly active university students perceive are available to them that their less active counterparts do not. In an effort to extend our understanding of the overall utility of social provisions in the exercise domain, particularly among these other age groups, this study extended previous research (e.g., Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002) to a university-aged sample.

1.2.6 Preferred forms of social support and exercise

As highlighted in the previous section, existing exercise research has focused primarily on the perceived aspect of social support. However, social support theorists (e.g., Cohen & Hoberman, 1983) have proposed that varying circumstances present differences in social support needs. In other exercise settings (e.g., cardiac rehabilitation), participants' activity preference has been recognized as an important variable for researchers to consider when examining exercise participation (Moore, 1996).

While evidence exists to confirm that activity type preference is of critical importance to overall exercise participation (Booth et al., 1997; Dowda et al., 2003),

only one study has indirectly addressed the issue of social support preference in the exercise setting (Watson et al., 2003). This study used a descriptive approach whereby participants were asked to identify reasons why they chose to exercise with others. Without being prompted for support-related responses, over half of all responses could be classified into one of Weiss's six social provisions, with social integration, guidance, and reliable alliance being the provisions identified by participants most often. Because an understanding of social support preferences could help to more clearly direct the development of exercise intervention programs, the present study was the first to examine individuals' perceptions about which social provisions they prefer to receive in the exercise setting.

1.2.7 Congruence between perceived and preferred social support

To extend previous exercise research, this study aimed to examine the social provisions that first-year university students perceived to be available in the exercise setting. As well, to extend our existing knowledge of the social provisions, this study also examined those social provisions that participants preferred to have available in this setting. However, it has also been argued that, when the forms of social support perceived to be available to an individual match his or her personal requirements (or preferences) for social support, this can yield the greatest benefit for health (cf. Cohen & McKay, 1984; Rook & Underwood, 2000). Given that being physically active is a health-promoting behaviour, it is possible that the proposition that a high match between perceptions and perceptions could improve exercise behaviour. That is, if the forms of social support an exerciser prefers match the forms of social support that are available in the exercise setting, this may result in a positive outcome (i.e., higher exercise levels).

Conversely, if the preferred forms of support are not available to the exerciser, this may result in a negative outcome (i.e., lower exercise levels).

This question is highly pertinent to intervention design because, if certain components of social support are necessary to promote exercise, then knowing these makes it possible to create more effective intervention programs (Cutrona & Russell, 1990). Accordingly, this was addressed in this study by assessing whether the congruence (i.e., optimal match; Cutrona & Russell, 1990) between an exerciser's social support preferences and the social support perceived in the exercise setting related to exercise behaviour.

1.3 Statement of problem

Overall, this study was interested in exploring university-aged individuals' perceptions about the social provisions in their experiences with exercise. The first objective of this study was to examine the social provisions that young adult participants perceive are available to them when exercising with others. Based on extant research with middle-aged adults, it was hypothesized that reassurance of worth, attachment, and social integration would emerge as variables that would discriminate between highly active and less active young adults (Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993). These provisions represent non-assistance-related provisions, which Duncan McAuley, et al. (1993) speculated may be particularly important for communicating positive beliefs about exercise.

The second objective of this study was to explore participants' preferences for the six social provisions when exercising with others. Given the exploratory nature of this research question, it was not clear which social provisions would be most preferred

by participants and whether the preferred provisions would discriminate participants with high and low energy expenditures. In a study that examined the reasons why university-aged students exercise in a group setting (Watson et al., 2003), the three social provisions that emerged most without prompting were social integration, guidance, and reliable alliance. Based on these exploratory findings, it was predicted that the university students with high energy expenditures in this study would have a higher preference for these provisions (i.e., social integration, guidance, and reliable alliance) compared to those participants with low energy expenditures.

The third objective of this study was to evaluate whether the congruence (i.e., match) between participants' preferred and perceived provisions was related to energy expenditure. Based on the suggestion of Rook and Underwood (2000), it was predicted that the congruence between preferred and perceived provisions would relate to higher energy expenditure more strongly than the preferred score or the perceived score alone.

Chapter 2

Method

2.1 Participants

Participants were recruited from two undergraduate kinesiology classes at the University of Saskatchewan. Most of the students in these classes were first or second-year kinesiology students; however, there were some students from other disciplines (e.g., education) and in other years of their respective programs. Of the 346 students enrolled and registered in the two classes at the time of data collection, 201 students provided informed consent and participated in this study. It was not possible to determine what percentage of those in attendance completed the questionnaire, as class attendance was not taken.

The mean age of the sample was 21.48 years (SD = 3.96). Both males (29.4%) and females (68%) participated. The remaining 2.6% of participants did not specify whether they were male or female. Although it was recognized that aggregating males and females limits the generalizability of the results of this study, this decision was made in order to retain sufficient power for the data analysis procedures that were conducted.

In order to be included in the study, all participants must have reported engaging in exercise with others over the past 4 weeks. Exercise was defined to participants as "physical activity for a health and/or fitness-related purpose" (Nieman, 1998). Exercising "with others" was defined as engaging in exercise with at least one

other person. One caveat that is worth mentioning is this form of sampling may not represent the typical university-aged population. Given that individuals who had not engaged in "exercise with others" in the previous four weeks were not included, this may have led to an overestimation of the actual activity levels characteristic of the majority of this population.

Over 70% of participants indicated that the exercise patterns that they reported for this study involved a "typical month." Data collection took place during the winter semester, and neither the data collection period nor the 4-week exercise recall period conflicted with school examinations.

2.2 Measures

Perceived social support. A modified version of the Social Provisions Scale (SPS; Cutrona & Russell, 1987) was used to assess participants' perceived social support (see Appendix A). The SPS is based on conceptual model outlined by Weiss (1974) in which social support is viewed as a multidimensional construct that includes six scales. The instrument contains 24 items, with four items associated with each of the six scales: reliable alliance, guidance, opportunity for nurturance, reassurance of worth, social integration, and attachment. Participants respond on a 4-point Likert-type scale ranging from (1) "strongly disagree" to (4) "strongly agree".

Like previous exercise studies (Courneya & McAuley, 1995; Duncan & McAuley, 1993; Duncan, McAuley, et al., 1993), items were reworded from the original version to reflect an exercise setting with others. For example, "There are people who enjoy the same social activities I do", was changed to, "When I was exercising with others during the last month, there were people who enjoyed the same social activities as

I do." While it is possible that the validity of this questionnaire may be compromised in adjusting it for the exercise setting, it was felt that this would be acceptable for two reasons. First, a modified version of the SPS questionnaire has been validated in the exercise setting previously (e.g., Duncan, McAuley, 1993). Second, it has been suggested by Schutz (1966) that minor changes to questionnaires to reflect items such as context are acceptable and have little or no effect on the internal consistency or validity of a scale. As well, all negative questions were revised to a positive wording so they would correspond with the preferred SPS questions (see below). For example, "Other people in this exercise program do not view me as competent", was changed to, "While I was exercising with others during the last month, other people viewed me as competent." Although it was recognized that the change to making all items positively worded alters the scale, this method was felt to be the best way to investigate social support preferences and the congruence hypothesis.

The psychometric properties of the modified SPS used in previous exercise studies (which included positive and negative items) have been documented with middle-aged samples (Courneya & McAuley, 1995; Duncan & McAuley, 1993; Duncan, McAuley, et al., 1993). Most studies (Courneya & McAuley, 1995; Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Duncan & Stoolmiller, 1993) have reported acceptable internal consistencies for all social provisions subscales. For example, Cronbach's alpha values have ranged from .62 (reassurance of worth; Duncan, McAuley, et al., 1993) to .92 (guidance; Courneya & McAuley, 1995). Some researchers (e.g., Courneya & McAuley, 1995; Duncan, Duncan, et al., 1993) have questioned the six-factor structure of the modified SPS. In contrast, external discriminant validity estimates have indicated strong support for the relative independence of the social

support dimensions in the exercise domain in comparison with cohesion and subjective norm (Courneya & McAuley, 1995).

Preferred social support. Preferred social support was assessed using a modified version of the Social Provisions Scale (SPS) developed originally by Cutrona and Russell (1987). As noted above, the instrument was developed based on the premise that social support is a multidimensional construct (see Appendix A). It contains 24 items that are separated into 6 different scales (i.e., reliable alliance, guidance, opportunity for nurturance, reassurance of worth, social integration, and attachment). The item responses to the instrument questions are based on a 4-point Likert type scale ranging from (1) "strongly disagree" to (4) "strongly agree".

In the present study, a modified version of the SPS containing the six scales was used. Three modifications were made to the original scale. The first two modifications paralleled those made to the perceived social support scale outlined in the previous section: (1) It was adjusted to reflect an exercise setting with others and (2) all items were positively worded. The third modification involved rewording each item to reflect preferred social support. The adaptation of the instrument to reflect preferred social support was deemed appropriate for two reasons. First, to the author's knowledge, there are no other instruments available that assess social support preferences in the exercise setting. Second, as noted above, it has been suggested previously that minor context changes to items, such as the situational frame of reference, are acceptable and have little effect on the internal consistency or validity of an instrument (cf. Schutz, 1966). Some examples, which reflect the changes made to specific items, are listed below.

In the reliable alliance scale, an item that stated, "There are people in this exercise program I can depend on to help me if I really need it", in the original version

was changed to, “When I exercise with others, I prefer to have people I can depend on to help me if I really need it.” In the guidance scale, “There is a trustworthy person in this exercise program I could turn to for advice if I were having problems”, was modified to, “When I exercise with others, I prefer to have a trustworthy person I could turn to for advice if I were having problems.” In the reassurance of worth scale, “In this exercise program, my competence and skill are recognized”, was changed to, “When I exercise with others, I prefer to have my competence and skill recognized.” In the opportunity for nurturance scale, “There are people in this exercise program who depend on me for help”, was adjusted to, “When I exercise with others, I prefer to have people in this exercise program who depend on me for help.” In the social integration scale, “There are people who enjoy the same social activities I do”, was changed to, “When I exercise with others, I prefer to have people who enjoy the same social activities I do.” Finally, in the attachment scale, “I have close relationships in this exercise program that provide me with a sense of emotional security and well-being”, was modified to, “When I exercise with others, I prefer to have close relationships that provide me with a sense of emotional security and well-being.” As this is the first time this modified scale has been used in the exercise domain or elsewhere, no reliability or validity data exists.

Exercise participation. Exercise participation was operationalized as energy expenditure. It was assessed using the Modifiable Activity Questionnaire (MAQ; Kriska, Knowler, LaPorte, et al., 1990). The MAQ is a self-report measure of leisure-time physical activity that has been used previously with this population (Bostick, 2004). Although the MAQ was originally designed to assess recall of physical activity over a 12-month period, the version used in the current study assessed recall over a one-month period (see Appendix A).

In addition to being designed for easy modification across a variety of populations (Kriska et al., 1990), the exercise values obtained using the MAQ are easily interpreted as energy expenditure values as noted below. To complete the MAQ, participants were asked to identify the activities (from a list of pertinent exercise possibilities) they had performed with others in the previous 4 weeks. Estimates of frequency, duration, and intensity were obtained for all physical activities listed (Kriska & Bennett, 1992) to arrive at a final energy output value, represented as participants' expended kilocalories per kilogram of body weight per day (KKD).

The psychometric properties of this questionnaire have been tested over a one-month period and a one-year period (cf. Kriska et al., 1990). In the Kriska et al. (1990) investigation, test-retest reliabilities for leisure physical activity over one-month and one-year periods were reported as .45 and .63, respectively. In terms of convergent validity, this measure has been used alongside objective measures (e.g., Caltrax monitors) and correlations between leisure activity and activity monitor counts have ranged from .69 (one-year period) to .80 (one-month period; Kriska et al., 1990).

2.3 Procedures

Ethics approval was obtained from the Advisory Committee on Ethics in Behavioural Sciences Research at the University of Saskatchewan (see Appendix A). Permission to administer the questionnaires in the classroom setting was obtained from course instructors.

The data were collected from participants during class sessions. At the start of class, the instructor introduced the author to the students. The author then proceeded to briefly outline the purpose of the study to the potential participants and explain the

consent form. Individuals were then asked if they would like to volunteer for the study. They were told that the questionnaire would take approximately 10-15 minutes to complete and would contain questions about their exercise experiences with others. It was made clear to all potential participants that completing the questionnaire was voluntary and that non-participation would in no way affect their standing in the class, academically or otherwise. In addition, potential participants were assured of confidentiality and anonymity. Once all interested volunteers were identified, they were asked to read and sign the informed consent forms and then wait for the questionnaires to be distributed.

After receiving informed consent from interested individuals, several research assistants administered the questionnaires in the classroom setting. Participants were asked to complete the questionnaires individually. Anyone who had not participated in exercise with others in the past four weeks did not complete the questionnaire and was asked to sit quietly.

For all participants, the author guided them through the first section of the questionnaire relating to their exercise participation (i.e., the Modifiable Activity Questionnaire) as a group in order to eliminate any confusion. While the participants completed the questionnaires, the research assistants were also available to answer any questions posed by participants.

2.4 Analysis of data

Exercise participation was calculated using the MAQ to determine energy expenditure by (1) totalling the number of hours of each activity, (2) multiplying the total hours of each activity by an estimate of metabolic cost of that activity (expressed as

METs) to consider its energy requirement, (3) summing the activity estimate (hours x METs) of all activities for a final energy expenditure score across the 4-week period, and (4) dividing by the number of days in the 4-week period to get a daily value. MET values were obtained from the compendium of physical activity values outlined by Ainsworth (2002).

Based on their energy expenditure, participants were classified into two extreme groups: high energy expenditure and low energy expenditure. The high expenditure group included participants who fell one-half SD above the mean energy expenditure value and the low expenditure group included participants who fell one-half SD below the mean energy expenditure value for the group. Participants within one-half SD above or below the mean were eliminated from all subsequent analyses. This cut-point (i.e., plus or minus one-half SD) was selected because it would create two significantly distinct groups, while still retaining a considerable proportion of participants in the analyses. It was important to create two extreme groups so that any potential relationships that may exist between social support and high versus low energy expenditure would be most likely to emerge. This method of group separation (i.e., extreme groups) has been successfully used in other exercise-related studies examining social support (e.g., Duncan, Duncan, et al., 1993; Leslie et al., 1999).

To examine the structure of the social support measure (i.e., a modified version of the Social Provisions Scale; Cutrona & Russell, 1987), exploratory factor analyses were used. Factor analysis is a statistical technique that is used when a researcher wishes to determine which responses to multiple questions form coherent subsets (i.e., factors) that are relatively independent of one another (Tabachnick & Fidell, 1996). Factor analysis was considered important because the scale was modified for this study and it

was deemed important to ascertain whether the underlying structure was maintained after the modifications were implemented. In this study, two principal component analyses with varimax rotation were used to determine if the 24 items in each of the perceived and preferred versions of the SPS could be reduced into six distinct support functions to represent the six social provisions. A varimax rotation was used to ensure that the eigenvectors remained orthogonal and to rotate the axes of the plot to a position that would maximize the factor loadings (Pedhazur, 1997).

Given that the underlying structure for the SPS has been established, it could be argued that confirmatory factor analyses, wherein data can be fitted to an a priori model, would have been a better technique to use than exploratory factor analyses. However, it was reasoned that the more sophisticated confirmatory factor technique was beyond the scope of a Master's thesis project. To assess the reliability of the social support measure, Cronbach's alphas (1951) were used to determine the internal consistency reliabilities of the SPS subscales that emerged from the factor analysis.

To address the first two objectives of the study that explored the role of the perceived and preferred social provisions in exercise participation, two discriminant function analyses were conducted (e.g., one for perceived provisions and one for preferred provisions). Discriminant function analysis is a statistical technique that allows the researcher to identify variables that can be used to best differentiate individuals of two or more groups from one another (Vincent, 1999). In this study, this technique was used to determine which social provisions predicted membership in the high expenditure and low expenditure groups by examining the unique contribution of each variable (i.e., social provision) to the predictive equation for perceived and preferred provisions, separately. Statistical significance was considered at $p < .05$.

To address the third study objective that examined whether the congruence between the preferred and perceived social provisions is the strongest predictor of exercise participation (i.e., high versus low expenditure group), logistic regression techniques were employed. Although similar to linear regression, logistic regression techniques are used for situations where the dependent variable is dichotomous (Tabachnick & Fidell, 1996), such as in this analysis, where the outcome variable was high versus low energy expenditure.

To address the issue of analyzing the congruence data, a procedure suggested and used by Riemer and Chelladurai (1995) was conducted. While several studies assessing congruence have used discrepancy scores (e.g., Chelladurai, 1984; Horne & Carron, 1985; Schliesman, 1987), it has been argued that the difference between two variables provides no additional information over and above the component parts themselves (Riemer & Chelladurai, 1995). It is often the case that difference scores will typically be strongly related to one (or both) of its component parts; therefore, they are likely to lack discriminant validity. Given that Cronbach (1958) has established that the interaction of two variables is equivalent to the difference between them, one procedure that addresses the concerns associated with difference scores is to use an interaction term. Following this suggestion, Riemer and Chelladurai (1995) tested a congruence hypothesis using regression analyses wherein the main effects were entered first into the equation followed by the interaction of the two main effects. The specific regression procedure used to examine congruence in this study, which is outlined in the following paragraph, is presented schematically in Figure 1.

For each of the six social provisions, two sets of hierarchical regression analyses were conducted, for a total of 12 regressions. Hierarchical regression was chosen

because the order of variable entry for each regression can be controlled, and this was an important consideration in this procedure for assessing congruence (i.e., main effects first, followed by interaction term). Two sets of regression analyses were conducted to determine the amount of unique variance that the perceived, preferred, and congruence variables (i.e., interaction) each contributed to the prediction of energy expenditure. Given the large number of comparisons being made, and the possibility of increased Type 1 error, an adjusted per comparison alpha of $p = .004$ (.05/12 comparisons) was used in order to achieve a family-wise error rate of .05 (Tabachnick & Fidell, 1996).

In the first analysis, the preferred score was entered on the first step followed by the perceived score on the second step. In the second analysis, the perceived score was entered on the first step and the preferred score on the second step. In both analyses, the interaction term was entered on the third step. These two analyses were done for each of the six provisions separately. If the interaction term in either analysis made a significant contribution to the variance explained after entering the main effects, evidence would be provided to support the congruence hypothesis. That is, it would be concluded that the congruence between preferred provisions and perceived provisions is a better predictor of exercise expenditure (i.e., high versus low) than the main effects by themselves (i.e., perceived and preferred).

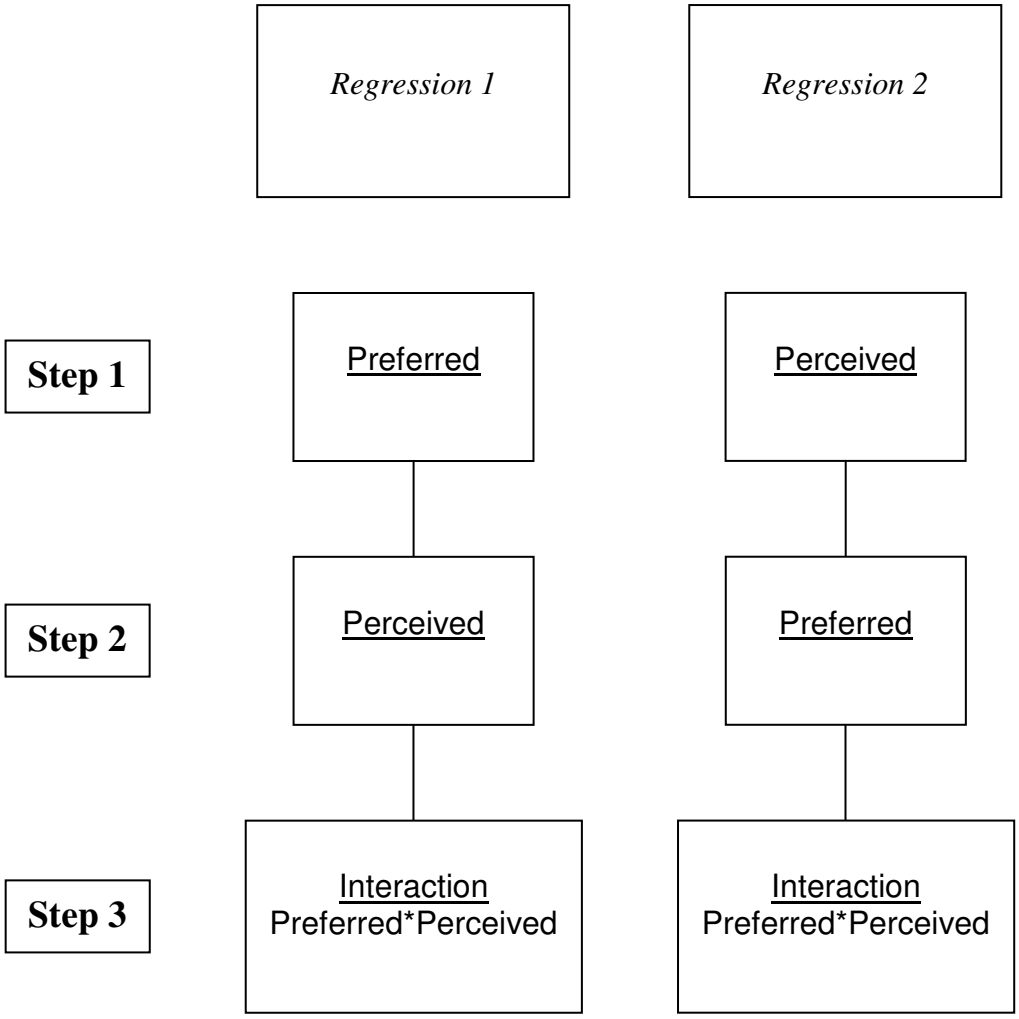

Figure 1

Schematic representation of logistic regression procedure

Chapter 3

Results

3.1 Preliminary analysis

3.1.1 Energy expenditure

As noted earlier, exercise participation was operationalized as an energy expenditure value. Energy expenditure was represented by kilocalories per kilogram of body weight expended per day (KKD), which is a common method used in the literature for expressing energy expenditure (Sallis & Owen, 1999).

Seven individuals were considered outliers (i.e., any data point that was distinct or deviant from the other data points, Pedhazur, 1997) because they had an energy expenditure that was more than two standard deviations from the mean, so their data were removed from further analyses. Among the remaining 194 participants, who represented a normally distributed sample, the mean energy expenditure was 3.8 KKD (SD = 2.8). It has been reported that the average Canadian young adult has an energy expenditure that approximates 2.5 KKD, which is below the 3 KKD level necessary to achieve cardiovascular benefit (Craig & Cameron, 2004). Notably, the average energy expenditure of this sample was greater than 3 KKD, indicating that the average participant in this study was active enough to achieve health benefits with just the activities performed with others. Participants reported participating in between 1 and 9 different types of activities with others (with an average of 3.4 activities) over the 4-week period. The most commonly reported activity type was walking, which was

mentioned by 42.3% of participants. Other activities commonly reported by participants included running/jogging (37.1%), using an elliptical cross-trainer (32.0%), and strength training (29.4%).

An extreme-groups design was used to differentiate between individuals who were sufficiently active to achieve health benefits and those who were not. Although it is acknowledged that an extreme-groups design results in a potential loss of information (e.g., in this study 74 participants were eliminated from the analyses), it was selected for two reasons. First, similar methods of group separation have been successfully used in other exercise-related studies examining social support (e.g., Duncan, Duncan, et al., 1993; Leslie et al., 1999). Second, highly active individuals are likely to accrue greater benefits from exercise participation than those who are less active. Because it was unclear whether participants in the middle of the energy expenditure distribution would be active enough to obtain the benefits of exercise, extreme groups were created in order to distinguish between individuals who were likely to be receiving health benefits from exercise versus those who were not likely to be benefiting from exercise. To create the extreme groups, individuals whose energy expenditure fell within one-half standard deviation above or below the mean were eliminated[2]. Participants whose energy expenditure was greater than 5.2 KKD comprised the high expenditure group (n = 48; 19 male and 29 female) and participants whose energy expenditure was less than 2.4 KKD comprised the low expenditure group (n = 72; 19 male and 53 female). After creating the extreme groups, the mean energy expenditure for the high expenditure group was 7.8

[2] Other methods of group separation also were conducted (e.g., mean-split, tertiles, quartiles). It should be noted that, regardless of the splitting method, the results were similar to those reported using the extreme-groups split.

KKD (SD =1.8) and the mean energy expenditure for the low expenditure group was 1.2 KKD (SD = 1.2).

A t-test for independent means indicated that individuals in the high group had significantly higher energy expenditure than individuals in the low group ($p < .001$). This provides some evidence that the high expenditure group was likely receiving significantly greater cardiovascular benefit from exercise than was the low expenditure group. This is also a notable division given that 3 KKD represents the level at which cardiovascular benefits can be obtained for young adults (Craig & Cameron, 2004). Incidentally, a daily energy expenditure of 3 KKD might be represented by 30 minutes of brisk, moderate-intensity walking (Craig & Cameron, 2004).

3.2 Scale analysis

3.2.1 Perceived social provisions

Because modifications were made to the original SPS scales, it was felt that exploratory factor analyses were necessary to evaluate whether items in the modified versions of the SPS fell into a six-factor structure to represent the six social provisions, as has been demonstrated in other studies (Cutrona & Russell, 1987; Duncan & Stoolmiller, 1993). Factor weights of .40 with cross-factor weightings of less than .30 were deemed necessary for any item to be considered to have loaded cleanly on a factor (Pedhazur, 1997).

Factor analysis (principal components with varimax rotation) on participants' responses to the 24 items of the modified SPS revealed a five-factor model. In terms of item loadings (see Table 1), the first factor contained all but one item from the SPS attachment subscale. The item from the SPS attachment subscale that did not load on

Table 1
Factor Analysis Results for the Perceived Version of the Modified Social Provisions Scale

Item Number	Item Description	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
11	… I had close relationships that provided me with a sense of emotional security and well-being.	.75				
17	… I felt a strong emotional bond with at least one other person.	.76				
21	… I felt intimacy with another person.	.78				
1	… There were people I could depend on to help me if I really needed it when I exercised.		.70			
10	… If something went wrong, someone would have come to my assistance.		.77			
18	…There was someone I could depend on for aid if I really needed it.		.76			
23	… There were people I could count on in an emergency.		.73			
5	… There were people who enjoyed the same social activities I do.			.79		
8	… I felt part of a group of people who share my attitudes and beliefs.			.68		
14	… There was someone who shared my interests and concerns.			.71		
22	… There was someone who liked to do the things I do.			.70		

Table 1 (cont'd)
Factor Analysis Results for the Perceived Version of the Modified Social Provisions Scale

Item Number	Item Description	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
4	… There were people who depended on me for help.				.72	
7	… I felt personally responsible for the well-being of another person.				.81	
15	… There was someone who really relied on me for his/her well-being.				.86	
24	… Someone needed me to care for them.				.73	
6	… Other people viewed me as competent.					.70
9	… I think other people respected my skills and abilities.					.83
13	… My competence and skill were recognized.					.81
20	… There were people who admired my talents and abilities.					.77
Eigenvalue		4.01	3.45	3.24	2.87	2.84
% of Variance		16.71	14.39	13.50	11.96	11.83
Cumulative % of Variance		16.71	31.10	44.60	56.56	68.39

Note: Items 2, 3, 12, 16, and 19 were deleted. Appendix D contains a listing of all factor loadings.

this factor was, “While I was exercising with others during the last month, I feel that I had close personal relationships with other people”. The four remaining factors contained identical items to the SPS subscales of reliable alliance, social integration, opportunity for nurturance, and reassurance of worth, respectively. None of the items from the SPS guidance subscale met the selection criteria to remain in the analysis given that they cross-loaded with other factors (namely, the factors of reliable alliance and social integration). As such, it was deleted from the model. This new five-factor model accounted for 68.4% of the total variance.

Internal consistency reliabilities using Cronbach’s alpha coefficients were calculated for each of the new five meaningful factors. This analysis was conducted to assess whether the items within each of the five new factors measured the same social provision (i.e., were all inter-correlated). The alpha values for the five factors of attachment, reliable alliance, social integration, opportunity for nurturance, and reassurance of worth were .80, .81, .85, .84, and .82, respectively. Given that the alpha values all were well above the 0.50 to .70 range suggested by Nunnally and Bernstein (1994) for adequate internal consistency, all were deemed acceptable for use in subsequent analyses. The means and standard deviations for each item appear in Table 2.

3.2.2 Preferred social provisions

In parallel to the analysis conducted with the perceived version of the SPS, a second factor analysis (principal components with varimax rotation) was performed to assess the six-factor structure of the preferred version of the SPS (Cutrona & Russell, 1987). Again, the results revealed a five-factor model. In terms of item loadings (see Table 3), the first factor contained all but one item from the SPS guidance subscale. The

Table 2
Means and Standard Deviations of Perceived SPS Questions

Item Number	Item Description	M	SD
	Reliable Alliance		
1	When I was exercising with others during the last month, there were people I could depend on to help me if I really needed it when I exercised.	3.1	.65
10	While I was exercising with others during the last month, if something went wrong, someone would have come to my assistance.	3.3	.58
18	While I was exercising with others during the last month, there was someone I could depend on for aid if I really needed it.	3.2	.58
23	While I was exercising with others during the last month, there were people I could count on in an emergency.	3.3	.59
	Reassurance of Worth		
6	While I was exercising with others during the last month, other people viewed me as competent.	3.2	.49
9	While I was exercising with others during the last month, I think other people respected my skills and abilities.	3.1	.50
13	While I was exercising with others during the last month, my competence and skill were recognized.	2.9	.62
20	While I was exercising with others during the last month, there were people who admired my talents and abilities.	2.9	.65

Table 2 (cont'd)
Means and Standard Deviations of Perceived SPS Questions

Item Number	Item Description	M	SD
	Opportunity for Nurturance		
4	While I was exercising with others during the last month, there were people who depended on me for help.	2.7	.73
7	While I was exercising with others during the last month, I felt personally responsible for the well-being of another person.	2.3	.73
15	While I was exercising with others during the last month, there was someone who really relied on me for his/her well-being.	2.3	.70
24	While I was exercising with others during the last month, someone needed me to care for them.	2.1	.81
	Social Integration		
5	While I was exercising with others during the last month, there were people who enjoyed the same social activities I do.	3.3	.58
8	While I was exercising with others during the last month, I felt part of a group of people who share my attitudes and beliefs.	3.1	.62
14	While I was exercising with others during the last month, there was someone who shared my interests and concerns.	3.1	.61
22	While I was exercising with others during the last month, there was someone who liked to do the things I do.	3.3	.56

Table 2 (cont'd)
Means and Standard Deviations of Perceived SPS Questions

	Item Description	M	SD
	Attachment		
11	While I was exercising with others during the last month, I had close relationships that provided me with a sense of emotional security and well-being.	2.8	.71
17	While I was exercising with others during the last month, I felt a strong emotional bond with at least one other person.	2.8	.81
21	While I was exercising with others during the last month, I felt intimacy with another person.	2.3	.86

Note: Scores on each question range from 1 to 4 points, where a higher score indicates greater social support.

Table 3
Factor Analysis Results for the Preferred Version of the Modified Social Provisions Scale

Item Number	Item Description	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
12	… I prefer to have someone who I could talk to about important decisions in my life.	.75				
16	… I prefer to have a trustworthy person I could turn to for advice if I were having problems.	.78				
19	… I prefer to have someone I feel comfortable talking about problems with.	.82				
5	… I prefer to have people who enjoy the same social activities I do.		.70			
8	… I prefer to feel part of a group of people who share my attitudes and beliefs.		.68			
14	… I prefer to have someone who shared my interests and concerns.		.59			
22	… I prefer to have someone who liked to do the things I do.		.64			
1	… I prefer to have people I can depend on to help me if I really need it.			.55		
10	… I prefer to know that, if something went wrong, someone would have come to my assistance.			.69		
18	…There was someone I could depend on for aid if I really needed it.			.78		
23	… I prefer to have people I could count on in an emergency.			.74		

Table 3 (cont'd)
Factor Analysis Results for the Preferred Version of the Modified Social Provisions Scale

Item Number	Item Description	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
6	… I prefer to have other people view me as competent.				.51	
13	… I prefer to have my competence and skill recognized.				.82	
20	… I prefer to have people who admire my talents and abilities.				.74	
7	… I felt personally responsible for the well-being of another person.					.77
15	… There was someone who really relied on me for his/her well-being.					.79
Eigenvalue		3.55	2.80	2.76	2.35	2.30
% of Variance		14.80	11.67	11.49	9.78	9.58
Cumulative % of Variance		14.80	26.47	37.96	47.74	57.32

Note: Items 2, 3, 4, 9, 11, 17, 21, and 24 were deleted. Appendix E contains a listing of all factor loadings.

item from the SPS guidance subscale that did not load on this factor was, “While I exercise with others, I prefer to have someone that I can turn to for guidance in times of stress”. The second and third factors contained identical items to the SPS subscales of social integration and reliable alliance, respectively. The fourth factor contained all but one item from the SPS reassurance of worth subscale. The item that was not included was, “When I exercise with others, I prefer to have other people who respect my skills and abilities”. The fifth factor contained two items from the SPS opportunity for nurturance subscale. The two items that were eliminated were “When I exercise with others, I prefer to have people who depend on me for help” and “When I exercise with others, I prefer to have someone who needs me to care for them”. None of the items from the SPS attachment subscale met the selection criteria to remain in the analysis given that they cross-loaded with other factors (namely, the factors of reliable alliance and opportunity for nurturance), and as such, was removed from the model. This new five-factor model accounted for 57.3% of the total variance.

The internal consistencies of the new five factors of the preferred social provisions also were determined using Cronbach’s alpha coefficients. The alpha values for the five factors of guidance, social integration, reliable alliance, reassurance of worth, and opportunity for nurturance were .82, .73, .73, .70, and .68, respectively. All subscales were considered acceptable for use in subsequent analyses because these alpha values all fell within or exceeded the range suggested by Nunnally and Bernstein (1994) for adequate internal consistency. The means and standard deviations for each item appear in Table 4.

Table 4
Means and Standard Deviations of Preferred SPS Questions

Item Number	Item Description	Mean	SD
	Reliable Alliance		
1	When I exercise with others, I prefer to have people I can depend on to help me if I really need it.	3.2	.64
10	When I exercise with others, I prefer to know that, if something went wrong, someone would come to my assistance.	3.5	.54
18	When I exercise with others, I prefer to have someone I can depend on for aid if I really need it.	3.1	.54
23	When I exercise with others, I prefer to have people I can count on in an emergency.	3.2	.56
	Guidance		
12	When I exercise with others, I prefer to have someone who I could talk to about important decisions in my life.	2.5	.75
16	When I exercise with others, I prefer to have a trustworthy person I could turn to for advice if I were having problems.	2.8	.68
19	When I exercise with others, I prefer to have someone I feel comfortable talking about problems with.	2.7	.73

Table 4 (cont'd)
Means and Standard Deviations of Preferred SPS Questions

Item Number	Item Description	Mean	SD
	Reassurance of Worth		
6	When I exercise with others, I prefer to have other people who view me as competent.	3.3	.65
13	When I exercise with others, I prefer to have my competence and skill recognized.	2.9	.59
20	When I exercise with others, I prefer to have people who admire my talents and abilities.	2.7	.70
	Opportunity for Nurturance		
7	When I exercise with others, I prefer to feel personally responsible for the well-being of another person.	2.2	.63
15	When I exercise with others, I prefer to have someone who really relies on me for his/her well-being.	2.2	.60
	Social Integration		
5	When I exercise with others, I prefer to have people who enjoy the same social activities I do.	3.4	.67
8	When I exercise with others, I prefer to feel part of a group of people who share my attitudes and beliefs.	3.1	.64
14	When I exercise with others, I prefer to have someone who shares my interests and concerns.	3.0	.56
22	When I exercise with others, I prefer to have someone who likes to do the things I do.	3.2	.58

Note: Scores on each question range from 1 to 4 points, where a higher score indicates greater social support.

3.2.3 Descriptive analyses

Because it has been acknowledged that one weakness of the Social Provisions Scale (Cutrona & Russell, 1987) is that the subscales may be highly inter-correlated (e.g., Sarason & Sarason, 1994), bivariate correlations and tolerance scores were used to test for multicollinearity between the social provision factors. Multicollinearity occurs when one or more predictor variables are highly correlated making it difficult to interpret the relative effects of individual predictors (Vincent, 1999). Table 5 displays bivariate correlations between the 10 new factors (5 perceived and 5 preferred) and energy expenditure. No bivariate correlations exceeded $r = .80$, a value which has been used to indicate the possible presence of multicollinearity (Licht, 1995). Further, as tolerance index scores all fell within an acceptable range (from .62 to .81 for the perceived provisions and .66 to .87 for the preferred factors), there appeared to be no evidence of multicollinearity among the social provision factors. Taken together, these values provide little evidence for the presence of multicollinearity, and as such, all factors were retained for the main analysis.

To assess whether participants would differ on their perceptions of the perceived and preferred subscales on each of the four provisions, paired t-tests were conducted. Given that only four social provisions emerged from the factor analyses that were common to both the perceived and preferred variants (i.e., reliable alliance, reassurance of worth, opportunity for nurturance, and social integration), only these provisions could be compared in this analysis. Significant differences were found between perceived and preferred for two of the provisions - reassurance of worth ($t(192) = -2.29$, $p < .05$) and opportunity for nurturance ($t(193) = -2.80$, $p < .01$). For each of these provisions, the perceived variant was endorsed more than the preferred variant.

Table 5
Inter-item Correlations Among Energy Expenditure, Perceived SPS Subscales, and Preferred SPS Subscales

	1	2	3	4	5	6	7	8	9	10	11
1. Energy Expenditure (KKD)	1.00										
2. Perceived Factor 1 (Attachment)	-.15	1.00									
3. Perceived Factor 2 (Reliable Alliance)	-.04	.43**	1.00								
4. Perceived Factor 3 (Social Integration)	.11	.51**	.52**	1.00							
5. Perceived Factor 4 (Opportunity for Nurturance)	-.02	.43**	.20**	.38**	1.00						
6. Perceived Factor 5 (Reassurance of Worth)	.12	.34**	.25**	.47**	.35**	1.00					
7. Preferred Factor 1 (Guidance)	-.14	.31**	.32**	.37**	.37**	.16*	1.00				
8. Preferred Factor 2 (Social Integration)	.04	.24**	.20**	.58**	.17*	.28**	.35**	1.00			
9. Preferred Factor 3 (Reliable Alliance)	-.12	.16*	.51**	.28**	.26**	.12	.46**	.34**	1.00		
10. Preferred Factor 4 (Reassurance of Worth)	.03	.16*	.16*	.33**	.15*	.52**	.27**	.47**	.25**	1.00	
11. Preferred Factor 5 (Opportunity for Nurturance)	.07	.16*	.02	.22**	.37**	.21**	.29**	.21**	.16*	.26*	1.00

* $p < .05$, ** $p < .01$

3.3 Main analyses

As mentioned previously, two discriminant function analyses (perceived and preferred done separately) were conducted to determine which social provisions predicted membership in the high expenditure and low expenditure groups. In terms of perceived provisions, it was hypothesized that reassurance of worth, attachment, and social integration would discriminate between high expenditure and low expenditure participants. In terms of preferred provisions, it was hypothesized that social integration, guidance, and reliable alliance would discriminate between high expenditure and low expenditure participants. Finally, logistic regression was used to examine the congruence between the preferred and perceived provisions. It was hypothesized that a high congruence between preferred and perceived provisions would relate to high energy expenditure.

These three analyses will be presented separately for ease of interpretation. For the first two analyses, the five perceived factors and five preferred factors that emerged from the factor analysis were used, respectively. For the third analysis, which assesses the congruence hypothesis, only the four factors that emerged from the factor analysis that were consistent across both the perceived and preferred variants (i.e., reliable alliance, reassurance of worth, opportunity for nurturance, and social integration) were considered.

3.3.1 Perceived social provisions

As mentioned previously, individuals in the high expenditure group had energy expenditures greater than 5.2 KKD, while participants in the low expenditure group had energy expenditures less than 2.4 KKD. Discriminant analyses were used to determine

whether certain provisions were more significant in contributing to participants' high or low energy expenditure. The results of this analysis, as shown in Table 6, revealed that none of the perceived provision factors predicted membership in the high expenditure versus low expenditure groups (Wilks' Lambda = .927, X^2 (5) = 8.77, p = .119). The mean values for the perceived provisions, which ranged from 2.31 to 3.24 for the low expenditure group and from 2.29 to 3.28 for the high expenditure group, represent mid to high range responses on the 4-point Likert scale that was used for each item. In terms of normality, opportunity for nurturance was slightly positively skewed (.417). Values for kurtosis did not indicate a further deviation from normality. Despite the slight skew for opportunity for nurturance, no adjustments were made to the data because discriminant analysis is a robust technique that is not particularly sensitive to minor violations in the assumptions of normality (Tabachnick & Fidell, 1996).

3.3.2 Preferred social provisions

In terms of preferred social provisions, a similar analysis to the one conducted with the perceived provisions was done. The results from the discriminant function analysis revealed that the preferred provisions were not able to differentiate those individuals who were low versus high in energy expenditure (Wilks' Lambda = .957, X^2 (5) = 5.09, p = .405). As indicated in Table 7, the mean values for the provisions ranged from 2.20 to 3.24 for the low expenditure group and from 2.27 to 3.18 for the high expenditure group, representing mid to high range responses on the 4-point Likert scale. These five provisions were all normally distributed.

Table 6
Means and Standardized Discriminant Function Coefficients of Perceived Social Provisions for High and Low Energy Expenditure

	Energy expenditure (KKD)					
	Low active (N=72)		High active (N=48)			
Factor	Mean	SD	Mean	SD	Significance of F	Standardized discriminant function coefficient
Attachment	2.78	.72	2.56	.65	.091	.937
Reliable Alliance	3.24	.48	3.19	.48	.538	.265
Social Integration	3.18	.54	3.28	.45	.274	-.814
Opportunity for Nurturance	2.31	.63	2.29	.59	.821	.044
Reassurance of Worth	2.96	.48	3.06	.48	.287	-.363

Note. Wilks' Lambda = .927 (p = .119)

Table 7
Means and Standardized Discriminant Function Coefficients of Preferred Social Provisions for High and Low Energy Expenditure

	Energy expenditure (KKD)					
	Low active (N=72)		High active (N=48)			
Factor	Mean	SD	Mean	SD	Significance of F	Standardized discriminant function coefficient
Guidance	2.75	.58	2.58	.63	.112	.751
Social Integration	3.16	.49	3.18	.45	.769	-.497
Reliable Alliance	3.24	.44	3.14	.42	.200	.484
Reassurance of Worth	2.88	.53	2.91	.49	.791	.028
Opportunity for Nurturance	2.20	.55	2.27	.49	.484	-.483

Note. Wilks' Lambda = .957 (p = .405)

3.3.3 Congruence relationships

Two sets of hierarchical logistic regression analyses were conducted for each of the four provisions of reliable alliance, reassurance of worth, opportunity for nurturance, and social integration, resulting in a total of 8 regressions. Only these four factors were used for this analysis because they were the only emergent factors from the factor analysis common to both the perceived and preferred social provisions.

The purpose of this logistic regression analysis was to assess the potential congruence relationships between the four social provisions and level of energy expenditure (i.e., high versus low). The results of these analyses are shown in Tables 8 and 9. Although 8 separate regressions were conducted (i.e., 4 regressions entering each perceived provision first and 4 regressions entering each preferred provision first), the congruence values obtained for each individual provision were identical given that the interaction term (i.e., congruence) represents the product of two variables and does not depend upon the order of variable entry. The results for the logistic regression revealed that none of the social provision interactions of perceived X preferred were statistically significant: reliable alliance $\chi 2$ (3, n=120) = 3.09, p >.05; reassurance of worth $\chi 2$ (3, n=120) = 1.79, p >.05; opportunity for nurturance $\chi 2$ (3, n=120) = 1.51, p >.05; and social integration $\chi 2$ (3, n=120) = 2.02, p >.05 (see Tables 8 and 9). As can be seen, the results from all these analyses suggest that the congruence of the perceived and preferred social provisions were not able to differentiate between those participants who were in the high energy expenditure versus low energy expenditure groups.

Table 8
Summary of Hierarchical Regression Analysis for Variables Predicting High and Low Energy Expenditure Entering Perceived Provisions First

Factor	Step	*B*	p
Reliable Alliance	1[a]	-.12	.76
	2[b]	-.65	.22
	3[c]	1.10	.24
Reassurance of Worth	1	.46	.25
	2	-.13	.76
	3	-.34	.59
Opportunity for Nurturance	1	-.05	.87
	2	.34	.36
	3	-.41	.43
Social Integration	1	.44	.24
	2	-.21	.68
	3	-.46	.55

Note. [a] Step 1 Predictors: Perceived; [b] Step 2 Predictors: Perceived, Preferred; [c] Step 3 Predictors: Perceived, Preferred, Interaction

Table 9
Summary of Hierarchical Regression Analysis for Variables Predicting High and Low Energy Expenditure Entering Preferred Provisions First

Factor	Step	*B*	p
Reliable Alliance	1[a]	-.53	.23
	2[b]	.19	.69
	3[c]	1.10	.24
Reassurance of Worth	1	.14	.71
	2	.54	.25
	3	-.34	.59
Opportunity for Nurturance	1	.28	.42
	2	-.15	.64
	3	-.41	.43
Social Integration	1	.17	.66
	2	.56	.24
	3	-.46	.55

Note. [a] Step 1 Predictors: Preferred; [b] Step 2 Predictors: Preferred, Perceived; [c] Step 3 Predictors: Preferred, Perceived, Interaction

Chapter 4

Discussion

The overall goal of this study was to examine Weiss's (1974) social provisions in the exercise context with young adults. The first purpose of this study was to extend research with middle-aged adults that examined the social provisions employing Weiss's (1974) model in the exercise setting to a young adult population. Based on previous findings using adherence as the main outcome (e.g., Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993), it was hypothesized that participants who perceived that the provisions of reassurance of worth, attachment, and social integration were available would be in the high expenditure group. This hypothesis was not supported, as no perceived provisions predicted group membership.

The second purpose of this study was to examine whether the social provisions that participants preferred could be used to differentiate those individuals in the high expenditure versus low expenditure group. It was hypothesized that social integration, reliable alliance, and guidance would predict membership in the high expenditure versus low expenditure groups. This hypothesis also was not supported. In fact, no preferred provisions predicted group membership.

While these non-significant findings for the first two hypotheses are unexpected, there are a number of potential explanations that may help to explain why no differences emerged. The first explanation may simply reflect the fact that the outcome measure used in this study (i.e., energy expenditure across a number of activities) may not be

related to social support in any meaningful way. In this study, participants were given the opportunity to list all physical activities in which they had participated in the previous four weeks with others, and from this information, a total energy expenditure value for this 4-week period was determined. In contrast, other studies in this area of research that have found a relationship between Weiss's (1974) social provisions and exercise behaviour have all used a measure of adherence or compliance to estimate exercise (e.g., Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002), instead of a measure of energy expenditure as used in this study.

Although adherence and energy expenditure both represent measures of exercise participation, adherence reflects only the frequency of exercise, whereas energy expenditure reflects the product of three variables - frequency, intensity, and duration of exercise. One possibility that may explain why no differences were found in this study may reflect that social support as assessed by Weiss's model (1974) impacts on whether an individual maintains a regular exercise regime (as reflected by a measure of attendance/adherence), but does not impact the duration or intensity of that exercise bout (as captured in a measure of energy expenditure). As one example, the reliable alliance provision, which represents tangible forms of assistance (e.g., a ride, help with the exercises, etc.) and has consistently emerged in previous studies (Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002), may be important for encouraging an individual to get to the exercise bout but has no relevance to energy output.

In a similar vein, a provision such as social integration may impact positively on attendance behaviour but have little impact upon energy expenditure. For instance, it could be argued that a social network of similar others within the exercise bout

influences whether an individual attends, but has little relationship to the energy output that occurs while at the session. If it is the case that the provisions relate more to attendance behaviour than to energy expenditure, this may explain why others have observed a relationship between social support and adherence to an exercise program (Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002), and this study revealed no relationship between social support and energy expenditure.

A second explanation for the non-significant findings may reflect that this study assessed multiple forms of exercise. Although the previous studies that have used a specific exercise program were able to demonstrate a significant relationship between the social provisions and program participation (Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993; Fraser & Spink, 2002), it was felt that tapping into overall exercise with others would be a more accurate estimation of activity level than would specifying one type of activity (e.g., group fitness, walking, etc.) in this population.

The results from this study supported this latter conjecture since participants in this study reported engaging in a variety of physical activities; on average, individuals participated in more than three different types of activities with others over the 4-week period. Therefore, it could be argued that giving participants the opportunity to provide open-ended responses about the types of activities that they engaged in was a more fruitful approach than simply asking about one specific activity type, such as a group fitness class (cf. Duncan, Duncan, et al., 1993). However, this difference could also be an important reason for the non-significant relationship between the social provisions and energy expenditure in this study. One reason that may explain this speculation is the possibility that social support is situation-specific. Just as Weiss (1974) originally proposed, each of the social provisions may serve different functions depending on the

situation. Other social provision studies have used specific situations, such as a 12-week clinical prevention and rehabilitation exercise program (Fraser & Spink, 2002) or an 18-week structured exercise program (Duncan, McAuley, et al., 1993).

Although there may be a connection between certain forms of support with energy expenditure in certain situations, it could be that the assessment of multiple exercise situations in concert may have prevented any significant relationships from emerging between the social provisions and energy expenditure in specific exercise settings. For example, it is possible that the social integration provision may be related to energy expenditure in an exercise setting where an individual's energy output may have an impact on other people, such as in a recreational team sport, but is not related to an exercise setting where energy output may not directly influence others, such as in a group-based fitness class.

In a similar vein, a third explanation may be that social support could be more relevant to certain types of exercise than others. Although a wide range of exercise types were reported, walking was the most commonly cited type of activity, as it was mentioned by 42.3% of participants in this study. Perhaps, university students recognize the availability of social support more in structured exercise settings, such as group fitness classes or recreational team sports.

All previous studies that have examined the social provisions in the exercise setting have examined a structured, group-based exercise environment (e.g., Duncan, Duncan, McAuley, et al., 1993; Duncan, McAuley, et al., 1993; Fraser & Spink, 2002). Although a distinction between structured and unstructured exercise has been made in other research with this population (Bruner, Spink, Wilson, Watson, & Bostick, 2003), it is unclear how these two spectra of physical activities relate to social support. It is

possible that certain types of social support are more related to exercise in structured settings (e.g., group exercise classes) than in unstructured settings (e.g., walking with friends). For example, assistance-related provisions like guidance and reliable alliance may be more related to exercise in the structured setting, where there may be an obvious leadership figure or a particular need for assistance (e.g., help in using equipment). This supposition is in line with existing research conducted in structured exercise settings, where guidance and reliable alliance have consistently emerged as provisions related to adherence and compliance behaviours (e.g., Duncan, McAuley, et al., 1993; Fraser & Spink, 2002). While how differences in setting relate to certain forms of social support is still unclear, this remains an avenue that merits further examination, particularly given the diversity of exercise interests shown by participants in this study.

As speculated above, the failure to find significant differences in this study, while other studies have found meaningful differences, could have been due to the fact that the outcome measured in this study (i.e., energy expenditure) differed from that used in the other studies (i.e., measures of adherence). However, there have been studies that have examined the relationship between social support and a measure of energy expenditure. This begs the question of why other studies using energy expenditure found significant differences when examining social support and the current study did not.

One possible explanation for why a relationship between energy expenditure and social support has been observed in previous studies (e.g., Dowda et al., 2003; Leslie et al., 1999; Rovniak et al., 2002), but was not observed in the present study, may be related to the manner in which social support was examined. As mentioned earlier, these earlier studies measured social support in a unidimensional fashion by capturing the

existence of a socially supportive network. In contrast, it was assumed in this study that participants were part of a social network (given that all participants indicated they performed exercise with others); therefore, the more specific objective here was to examine the various functions served by this social network. It is possible that the difference in assessment of social support may have contributed to the disparate findings. This awaits future research.

The third purpose of this study was the examine whether a match between participants' social provision preferences and the provisions they perceived to be available in the exercise setting would discriminate between high and low energy expenditure levels. It was expected that congruence between preferred and perceived provisions would predict membership in the high and low energy expenditure groups, more so than either the perceived or preferred provisions alone. Again, this hypothesis was not supported.

Given that there were no main effects relating the social provisions to energy expenditure, it is possible that the reasons provided above for why there were no significant findings may also apply to the congruence hypothesis (e.g., use of a different outcome measure, assessing multiple settings versus one setting, assessing social support in a different way).

Another possible explanation for the failure to find a meaningful relationship between the interactions of social support and exercise behaviour may have resulted from sample size. As the ratio in this study fell below the minimum of 50 cases per predictor suggested to test hypotheses when using logistic regression, it is possible that an inadequate sample size may have been contributed to the failure to find significant

differences (Wright, 1997). However, the fact that no consistent patterns emerged in the relationships examined suggests that this explanation is less plausible.

Another potential explanation for why the congruence hypothesis was not supported may relate to the time referents provided for the social support measures. The measure for the perceived provisions was based on the version used by Duncan and colleagues (e.g., Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993). Their scale assessed participants' perceptions about the availability of certain provisions in a specified exercise class and for a specified period of time. The scale used in this study assessed participants' perceptions about the availability of certain provisions in all the physical activities in which they participated with others over a period of four weeks.

In contrast, the scale used to assess the preferred provisions in this study was identical to the perceived provisions scale used, except for one detail. The difference was that the time referent included in the perceived scale was not provided for the preferred provisions. The decision to eliminate the time referent (i.e., "in the past four weeks") for the preferred provisions was made so that participants would clearly recognize the distinction being made on the questionnaire between the provisions that were available (i.e., perceived provision) and the provisions that they preferred (i.e., preferred provisions).

In retrospect, neglecting to include this time referent on the preferred provisions may have caused problems. The resulting lack of correspondence between these two scales may have been problematic for testing the congruence hypothesis because it may have introduced additional error into the regression analyses owing to the different time referents used. Given that social support preferences in the exercise setting can and are likely to change over time, it is possible that participants' reported preferences for the

provisions may have differed between the four weeks prior to the study and when they actually completed the questionnaire. Future examination of the congruence hypothesis in this area of research will require researchers to be prudent about the correspondence of the perceived and preferred scales. It is recommended that the same time referent be provided for both scales; for example, if a 4-week referent is used again as it was in this study, participants should respond to both the perceived and preferred scales with regard to this 4-week period.

Although no significant relationships were detected with respect to the three hypotheses of this study, it could be argued that several positive contributions may have been made to the extant research. First, this was the first study to look at the specific dimensions of social support within a young adult age group. Among this population, social support is typically included among a host of other social cognitive variables examined on health-based surveys (e.g., Leslie et al., 1999; Steptoe et al., 1997; Wallace et al., 2000). As has been mentioned previously, most of the other quantitative studies using Weiss's (1974) Model of Social Provisions in the exercise setting have been conducted with middle-aged adults (e.g., Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002).

The only study to examine Weiss's (1974) model with university-aged participants was conducted by Watson and colleagues (2003). In an unprompted, open-ended fashion, participants were asked to identify reasons why they preferred to exercise with others. From the list of 377 reasons that were generated, over half the responses could be categorized into one of Weiss's (1974) six social provisions. All six of the social provisions identified by Weiss (1974) were mentioned; however, social integration appeared to be the most salient, followed by guidance and reliable alliance,

as was also the case in this investigation (see Table 7). In comparison, the provisions of attachment, nurturance and reassurance of worth were mentioned much less frequently, which begs the question of their usefulness in this setting. While a growing body of research has consistently shown that social support is important for university students' exercise participation (e.g., Dowda et al., 2003; Gyurcsik et al., 2004; Leslie et al., 1999, 2001), it may be that certain provisions are more salient than others for this age group. Future research will be needed to help to clarify the relationship of specific forms of social support to various outcomes of exercise (e.g., adherence, energy expenditure, etc.) among this population.

The second contribution this study makes is that exploratory factor analyses on the modified version of the perceived Social Provisions Scale (Cutrona & Russell, 1987) revealed five distinct factors. As noted by Froman (2001), exploratory factor analyses represent the first step in the empirical exploration of what dimensions contribute to a construct. Confirmatory factor analyses, by comparison, represent the systematic testing of hypotheses surrounding the underlying structures of an instrument (Froman, 2001); this is a more rigorous procedure that may involve multiple data pools and ongoing adjustments to the items or the instrument. Although hypotheses were established a priori regarding the three main lines of inquiry in this study (i.e., perceived provisions, preferred provisions, and the congruence of provisions), and the limitations of conducting an exploratory factor analysis as opposed to a confirmatory factor analysis were acknowledged (e.g., an exploratory factor analyses may not uncover the real dimensions underlying a construct; Froman, 2001), it was felt that exploratory factor analyses would be more appropriate than confirmatory factor analyses in this study for two reasons. First, as mentioned previously, confirmatory

factor analysis techniques are beyond the scope of a Master's student. Second, this was the first study to explore the role of social support preferences. Given the exploratory nature of both social support preferences and the congruence hypothesis, it was felt that exploratory factor analyses would be most appropriate for the preferred scale, and was similarly conducted for the perceived scale.

Because only five factors emerged in the factor analysis, as opposed to the original six provisions that Weiss (1974) proposed, it is possible that the revision of the preferred support scale contributed to this finding. Although the preferred support scale used in this study was based upon the original Social Provisions Scale (Cutrona & Russell, 1987), the revision involved making two additional changes to each item from the original version. One change was the addition of the "I prefer" stem to reflect social support preferences. Given that it has been argued that minor wording changes to scales to reflect context are acceptable as long as the overall meaning of the item is upheld (e.g., Schutz, 1966), it was felt this change would not have impacted upon the scales. The second change was to make all the items positively worded in order to maintain correspondence between the perceived and preferred support scales. This was not perceived to be a problem as it has been suggested that negatively worded items should be avoided as they tend to have lower validity coefficients than positively worded items (Streiner & Norman, 1995). However, it is possible that these changes, in combination, may have altered the scales to the point where the social provisions may not have been adequately represented.

Interestingly, the guidance provision did not emerge in this study's factor analysis, whereas it was the strongest indicant of social support in Duncan and Stoolmiller's (1993) study. This inconsistency regarding the guidance provision may be

related to a number of systematic differences in methodology between the two studies, including differences in participants' age (young adults versus middle-aged adults), participants' familiarity with exercise (active Kinesiology students versus previously sedentary individuals), and exercise setting (generic exercise versus supervised exercise program).

It is possible that the guidance provision (i.e., the advice and information perceived to be available in the exercise setting) is less salient for young, active individuals who may be well-informed about exercise than it is for middle-aged, previously sedentary individuals taking part in a supervised exercise program. Examining the guidance provision, along with the other five provisions, in other populations (e.g., children, elderly, at-risk populations such as cardiac rehabilitation) and exercise settings (e.g., schools, community and clinical exercise programs) would be a valuable pursuit in future research, particularly given the value researchers in the exercise domain have placed upon social cognitive constructs, like social support, to influence exercise behaviours (e.g., Carron, Hausenblas, & Mack, 1996).

A third positive aspect of this study is the addition of social support preferences. Although no relationship emerged between social preferences and energy expenditure in this study, it seems worthy of future examination for at least three reasons. First, five distinct factors emerged from the factor analysis conducted on the 24 preferred provision items. Within factors, internal consistency values indicated that the inter-correlations between same-scale items were within an acceptable range (cf. Nunnally & Bernstein, 1994). Second, there were differences between the perceived and preferred variants on two social provisions, reassurance of worth and opportunity for nurturance. This suggests that participants may have been distinguishing between perceived and

preferred provisions. While it is acknowledged that design factors such as the difference in the time referent may have contributed to the differences found in this study between perceived and preferred provisions, the fact that differences were found suggests that future research should incorporate the concept of participants' preferences for the social provisions, as there may be noteworthy differences between the preferred construct and the perceived construct of social support. Third, it is possible that a different outcome measure may relate better to preferred social support than the measure used in this study (e.g., energy expenditure). Just as other studies examining Weiss's social provisions in a exercise setting have found a relationship with a measure of adherence (Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993) and compliance (Fraser & Spink, 2002), it is possible that these types of outcomes also would be associated with preferred social support. However, it is also possible that a follow-up examination of social support preferences would be best served by an alternative measure of preferred social support, and perhaps a tool that has been developed through a qualitative line of inquiry.

As has been emphasized from the outset of this paper, designing and carrying out of research programs from a theoretical perspective is the most effective way to advance knowledge about social and behavioural processes, such as social support. Although the primary aim of this study was to examine Weiss's (1974) six social provisions, the testing of the model in this study indicated that a five-factor structure for the perceived social provisions was more appropriate among this sample. Similarly, a five-factor model also emerged for the preferred provisions, although the five preferred provisions that emerged were slightly different than those that emerged for the perceived provisions. This discrepancy between the emergent factors of the perceived

and preferred provisions may have occurred because of the differences in the relevant forms of support that participants perceived to be available and those they preferred to have available.

Therefore, with the emergence of two different five-factor structures across the perceived and perceived provisions, one cannot assume that all six provisions of Weiss's (1974) model will be equally salient across other samples. Further, it is possible that across different populations and/or exercise settings, the same five provisions may not emerge as they did in this study. For instance, confirmatory factor analysis has verified a 6-factor model among a sample of sedentary, middle-aged adults (Duncan & Stoolmiller, 1993). As such, it may be important that researchers conduct additional factor analyses in order to test the six-factor structure of the model among their population of interest and investigate the factors that emerge in their investigation accordingly.

A fourth positive aspect of this study was the assessment of congruence between the perceived and preferred social provisions. Although the congruence relationships examined in this study did not emerge, the results of one study should not be used to "throw the baby out with the bath water". It may still be important to understand whether maximizing exercise is associated with specific participant preferences. For instance, if an individual who prefers to receive a great deal of advice and information about exercise joins a supervised exercise program that offers one-on-one instruction and informational sessions, will this maximize adherence to the program? Similarly, is a person who enjoys making friends and meeting new people going to have better attendance or maximized energy output at an exercise class that

emphasizes team-building and socialization than a task-oriented individual who is not interested in a social exercise environment?

It would be helpful to replicate the design of this study, improving upon the aforementioned measurement issues (e.g., focus on one specific exercise setting/type, assess attendance/adherence as the main outcome rather than energy expenditure, ensure correspondence between measures of perceived and preferred provisions), in order to clarify whether congruence between perceived and preferred forms of support is maximally beneficial to exercise participation.

4.1 Future directions

The results of the present study point to several directions for future research.

1. This was the first study to examine the relationship between the social provisions using Weiss's (1974) model and energy expenditure. While other studies have identified relationships between the social provisions and exercise using an outcome such as adherence or compliance (e.g., Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Fraser & Spink, 2002), no relationship was observed in this study between the social provisions and energy expenditure. One factor that may have confounded any meaningful relationships between the provisions and energy expenditure was the examination of energy expenditure across multiple physical activities instead of within one specified type of exercise. Because energy expenditure reveals valuable information about the intensity and duration of an individual's exercise participation, it may still be important to evaluate this outcome; however, perhaps alongside an alternative outcome, such as program attendance. It is also recommended that researchers

focus on a specific program or type of exercise (e.g., walking), so as to eliminate any potential confounders, in an effort to clarify the role of Weiss's (1974) social provisions in the exercise domain.

2. This was the first study to explore the social provisions with a young adult population. Given that other studies have had success in demonstrating relationships between the social provisions and adherence among middle-aged adults using adherence (Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993) and compliance outcomes (Fraser & Spink, 2002), it would be worthwhile to extend this existing research by assessing adherence/compliance outcomes with young adults.
3. A number of researchers have suggested that gender may play a moderating role in the relationship between social support and exercise (e.g., Leslie et al., 1999). With regard to Weiss's (1974) Model of Social Provisions, Duncan and colleagues (Duncan, Duncan, et al., 1993; Duncan, McAuley, et al., 1993) have identified potential differences between males and females in terms of their perceptions about the social provisions in the exercise setting. Specifically, the reassurance of worth provision may be of primary importance to females, who may benefit from enhanced self-esteem as an exerciser (Duncan, Duncan, et al., 1993). In contrast, male exercisers may benefit from the availability of the social integration provision, as they value being part of a group (Duncan, Duncan, et al., 1993). It could also be that their preferences for social support are divergent, given that males and females may experience different barriers to exercise participation (Tergerson & King, 2002). Because young women have cited "no time" as a barrier to exercise, it is possible that they have greater preferences for

tangible forms of support (e.g., rides) that may allow them the time and means to fit exercise into their schedule (Tergerson & King, 2002). In contrast, as young men have cited "wanting to do other things with my time" as a barrier to exercise, they may be more likely than women to prefer a social exercise environment (Tergerson & King, 2002). Owing to the fact that this was an exploratory study, and the fact that the sample was primarily female, males and females were not considered separately. However, it may be advantageous for the future research to conduct separate analyses for male and female participants, given the argument that social support differences may exist between the genders and intervention efforts would be greatly advanced by understanding these differences (Leslie et al., 1999; Duncan, Duncan, et al., 1993).

4. Additionally, because people who are sedentary or at high risk for chronic health conditions (e.g., overweight and obese individuals) may have the greatest support needs, these populations also should be investigated in future research. Extending this line of research into clinical exercise programs (e.g., cardiac rehabilitation) would be one suggestion. Fraser and Spink (2002) reported that the reassurance of worth and guidance provisions were able to discriminate between high and low attendees of a clinical exercise program. It would be interesting to replicate the design of this study in that type of setting.
5. This study replicated previous exercise research (Duncan, McAuley, et al., 1993; Duncan, Duncan, et al., 1993; Duncan & Stoolmiller, 1993; Fraser & Spink, 2002) by investigating the social provisions that participants perceived to be available in their exercise setting. The major difference with this study was that it queried participants about the social provisions in all of their exercise pursuits,

rather than in one specified program. No relationships were observed between the provisions and the exercise outcome used in this study (i.e., energy expenditure). However, one meaningful finding arose that may inform future research. The factor analysis among the provisions to examine the six-factor structure of Weiss's (1974) model revealed a five-factor structure. Although this does not imply that a five-factor model is more appropriate for the exercise domain, it does point to the importance of examining the structure of the model across varying sample types (e.g., age, exercise status, etc.) and exercise settings (e.g., community, clinical, etc.).

6. In addition to examining participants' perceptions about the availability of the social provisions, this study also included an assessment of participants' preferences for the social provisions in the exercise setting. Because differences did emerge between two perceived and preferred social provisions (i.e., reassurance of worth and opportunity for nurturance), it is recommended that future research investigate the potentially different roles of the perceived and preferred constructs in the exercise setting. If researchers were to quantitatively investigate the preferred provisions, it would be important to provide a time referent, something this study neglected to include in its assessment of the preferred provisions. Another possibility that also might prove worthwhile might be to examine the social provision preferences using a qualitative perspective. With a qualitative analysis, it is possible that participants could identify different provisions as being salient to exercise participation than those that have emerged in the past (i.e., reliable alliance, reassurance of worth, attachment, social integration). As well, qualitative analysis could provide insight into the

differences between the perceived and preferred provisions, and the relative importance of each.

7. This study was also interested in examining whether the congruence between the perceived and preferred provisions maximized exercise behaviour (operationalized as energy expenditure). With respect to the congruence hypothesis specifically, one note of caution for researchers is to ensure correspondence between the measurement scales of the perceived and preferred provisions. Based on the lack of correspondence between the perceived and preferred social provision measures in this study, replication of this study using parallel support measures (i.e., using the same time frame) is warranted. As has already been addressed, it would also be enlightening to examine the concept of congruence from a qualitative focus, as this method may elicit more in-depth, information-rich data than a quantitative study alone would.
8. Finally, Antonucci (1983) has argued that most social support research is cross-sectional and age-specific (as was the case in this study), and that there is a need to consider the importance of continuity and change in social support. In response to this need, it would be valuable to conduct a long-term investigation in the exercise setting to examine how the relevance and importance of the social provisions (perceived and preferred) change over time.

References

Ainsworth, B. E. (2002, January). The Compendium of Physical Activities Tracking Guide. Prevention Research Centre, Norman J. Arnold School of Public Health, University of South Carolina. Retrieved (March 13, 2004) from the World Wide Web: http://prevention.sph.sc.edu/tools/docs/documents_compendium.pdf

Antonucci, T. C., & Johnson, E. H. (1994). Conceptualization and methods in social support theory and research as related to cardiovascular disease. In S. A. Shumaker & S. M Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 21-40). New York: Plenum Press.

Bailey, D. A., Faulkner, R. A., & McKay, H. A. (1996). Growth, physical activity, and bone mineral acquisition. *Exercise and Sport Science Reviews, 24,* 233-266.

Bauman, A., Madill, J., Craig, C. L., & Salmon, A. (2004). ParticipACTION: This mouse roared, but did it get the cheese? *Canadian Journal of Public Health, 95* S14-S19.

Bauman, A., McLean, G., Hurdle, D., Walker, S., Boyd, J., van Aalst, I., et al. (2003). Evaluation of the national "Push Play" campaign in New Zealand – creating population awareness of physical activity. *New Zealand Medical Journal, 116,* 1179.

Baumeister, R., & Leary, M. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117,* 497-529.

Booth, F. W., Gordon, S. E., Carlson, C. J., & Hamilton, M. T. (2000). Waging war on modern chronic diseases: primary prevention through exercise biology. *Journal of Applied Physiology, 88,* 774-787.

Booth, M. L., Bauman, A., Owen, N., & Gore, C. J. (1997). Physical activity preferences, preferred sources of assistance, and perceived barriers to increased activity among physically inactive Australians. *Preventive Medicine, 26*, 131-137.

Bostick, J.M. (2004). *Exercising in a structured versus unstructured setting: An application of the Theory of Planned Behaviour*. Unpublished Master's thesis. University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Bostick, J. M., Spink, K. S., Bruner, M. W., Watson, J. D., & Wilson, K. S. (October, 2003). *Exercising in groups: What's the buzz?* Paper presented at the Annual Meeting of the Canadian Society for the Psychology of Sport and Physical Activity, Hamilton, Ontario, Canada.

Brawley, L. R., & Poag-DuCharme, K. A. (1992). *Self-efficacy as a mediator in the influence of social support on the exercise adherence of the elderly.* Gloucester, ON: Canadian Fitness and Lifestyle Research Institute.

Bray, S. R., & Born, H. A. (2004). Transition to university and vigorous physical activity: Implications for health and psychological well-being. *Journal of American College Health, 52,* 181-188.

Bruner, M. W., Spink, K. S., Wilson, K. S., Watson, J. D., & Bostick, J. M. (October, 2003). Exercising with others: Group versus collection of individuals. Paper presented at the Annual Meeting of the Canadian Society for the Psychology of Sport and Physical Activity, Hamilton, Ontario, Canada.

Buckworth, J. (2000). Exercise determinants and interventions. *International Journal of Sport Psychology, 31,* 305-320.

Carron, A.V., Hausenblas, H. A., & Mack, D. (1996). Social influence and exercise: A meta-analysis. *Journal of Sport & Exercise Psychology, 18,* 1-16.

Caspersen, C. J., Pereira, M. A., & Curran, K. M. (2000). Changes in physical activity patterns in the United States by sex and cross-sectional age. *Medicine & Science in Sports & Exercise, 32,* 1601-1609.

Caspersen, C.J., Powell, K.E., & Christenson, G.M. (1985). Physical activity, exercise, and physical fitness: Definition and distinctions for health-related research. *Public Health Reports, 100,* 126-131.

Cassel, J. (1976). The contribution of the social environment to host resistance. *American Journal of Epidemiology, 104,* 107-123.

Chelladurai, P. (1984). Discrepancy between preferences and perceptions of leadership behavior and satisfaction of athletes in varying sports. *Journal of Sport Psychology, 6*, 27-41.

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine, 38,* 300-314.

Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 3-25). New York: Oxford University Press.

Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology, 13,* 99-125.

Cohen, S., & McKay, G. (1984). Social support, stress, and the buffering hypothesis: A theoretical analysis. In A. Baum, S. E. Taylor, & J. E. Singer (Eds.), *Handbook*

of psychology and health: Social psychological aspects of health (Vol. 4, pp. 253-267). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. M. (1985). Measuring the functional components of social support. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 73-94). The Hague: Martinus Nijhoff Press.

Conference Board of Canada (1996). *Physical activity and the cost of treating illness.* (CFLRI Special Report Services). Ottawa, ON: CFLRI.

Courneya, K. S., & McAuley, E. (1995). Reliability and discriminant validity of subjective norm, social support, and cohesion in an exercise setting. *Journal of Sport & Exercise Psychology, 17,* 325-337.

Craig, C. L., & Cameron, C. (2004). *Increasing physical activity: Assessing trends from 1998-2003.* Ottawa, ON: Canadian Fitness and Lifestyle Research Institute.

Cronbach, L. J. (1951). Coefficient alpha and internal structure tests. *Psychometrika, 2,* 135-138.

Cronbach, L. J. (1958). Proposals leading to analytic treatment of social perception scores. In R. Tagiuri & L. Petrullo (Eds.), *Person perception and interpersonal behavior* (pp. 353-379). Stanford, CA: Stanford University Press.

Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in personal relationships* (Vol. 1, pp. 37-67). Greenwich, CT: JAI Press Inc.

Cutrona, C. E., & Russell, D. W. (1990). Type of social support and specific stress: Toward a Theory of Optimal Matching. In B. R. Sarason, I. G. Sarason, & G. R.

Pierce (Eds.), *Social support: An interactional view* (pp. 319-366). New York: John Wiley & Sons, Inc.

Darwin, C. (1872/1965). *The expression of emotions in man and animals.* Chicago: University of Chicago Press.

De Bourdeaudhuij, I., Sallis, J. F., & Vandelanotte, C. (2002). Tracking and explanation of physical activity in young adults over a seven-year period. *Research Quarterly for Exercise & Sport, 73,* 376-385.

Dishman, R. K. (1994). The measurement conundrum in exercise adherence research. *Medicine and Science in Sports and Exercise, 26,* 1382-1390.

Dowda, M., Ainsworth, B. E., Addy, C. L., Saunders, R., & Riner, W. (2003). Correlates of physical activity among U.S. young adults, 18 to 30 years of age, from NHANES II. *Annals of Behavioral Medicine, 26,* 15-23.

Duncan, T. E., Duncan, S. C., & McAuley, E. (1993). The role of domain and gender-specific provisions of social relations in adherence to a prescribed exercise regimen. *Journal of Sport & Exercise Psychology, 15,* 220-231.

Duncan, T. E., & McAuley, E. (1993). Social support and efficacy cognitions in exercise adherence: A latent growth curve analysis. *Journal of Behavioral Medicine, 16,* 199-218.

Duncan, T. E., McAuley, E., Stoolmiller, M., & Duncan, S. C. (1993). Serial fluctuations in exercise behaviour as a function of social support and efficacy cognitions. *Journal of Applied Social Psychology, 23,* 1498-1522.

Duncan, T. E., & Stoolmiller, M. (1993). Modeling social and psychological determinants of exercise behaviours via structural equation systems. *Research Quarterly for Exercise and Sport, 64,* 1-16.

Durkheim, E. (1897/1951). *Suicide, a study in sociology.* New York: Free Press.

Edwards, P. (2004). No country mouse: Thirty years of effective marketing and health communications. *Canadian Journal of Public Health, 95,* S6-S13.

Festinger, L., Schachter, S., & Back, K. (1963). *Social pressures in informal groups: A study of human factors in housing.* Stanford, CA: Stanford University Press.

Fraser, S. N., & Spink, K. S. (2002). Examining the role of social support and group cohesion in exercise compliance. *Journal of Behavioral Medicine, 25,* 233-249.

Froman, R.D. (2001). Elements to consider in planning the use of factor analysis. *Southern Online Journal of Nursing Research, 5.* Retrieved November 13, 2004, from www.snrs.org/members/journal.html

Grace, S. L., Abbey, S. E., Shnek, Z. M., Irvine, J., Franche, R. L., & Stewart, D. E. (2002). Cardiac rehabilitation I: review of psychosocial factors. *General Hospital Psychiatry, 24,* 121-126.

Gyurcsik, N. C., Bray, S. R., & Brittain, D. R. (2004). Coping with barriers to vigorous physical activity during transition to university. *Family and Community Health, 27*, 130-142.

Health Canada (1998). *Economic burden of illness in Canada, 1998* [Data file]. Available from Health Canada website, http://www.hc-sc.gc.ca

Hildebrand, K. M., & Johnson, D. J. (2001). Determinants of college physical activity class enrolment: Implications for high school physical education. *The Physical Educator, 58,* 51-56.

Hillsdon, M., Cavill, N., Nanchahal, K., Diamond, A., & White, I. R. (2001). National level promotion of physical activity: Results from England's ACTIVE for LIFE campaign. *Journal of Epidemiology and Community Health, 55,* 755-761.

Horne, T., & Carron, A. V. (1985). Compatibility in coach-athlete relationships. *Journal of Sport Psychology, 7,* 137-149.

House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 83-108). Orlando, FL: Academic Press.

Kemper, H. C. G., Verhagen, E. A. L. M., Milo, D., et al. (2002). Effects of health information in youth on adult physical activity: 20-year study results from the Amsterdam Growth and Health Longitudinal Study. *American Journal of Human Biology, 14,* 448-456.

Kriska, A. M., & Bennett, P. H. (1992). An epidemiological perspective of the relationship between physical activity and NIDDM: from activity assessment to intervention. *Diabetes/Metabolism Reviews, 8,* 355-372.

Kriska, A. M., Knowler, W. C., LaPorte, R. E., Drash, A. L., Wing, R. R., Blair, S. N., et al. (1990). Development of questionnaire to examine relationship of physical activity and diabetes in Pima Indians. *Diabetes Care, 13,* 401-411.

Lagarde, F. (2004). The mouse under the microscope: Keys to ParticipACTION's success. *Canadian Journal of Public Health, 95,* S20-S24.

Lakey, B., & Cohen, S. (2000). Social support theory and measurement. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 29-52). New York: Oxford University Press.

Leppin, A., & Schwarzer, R. (1990). Social support and physical health: An updated meta-analysis. In L. R. Schmidt, P. Schwenkmezger, J. Weinman, & S. Maes

(Eds.), *Health psychology: Theoretical and applied aspects* (pp. 185-199). London: Harwood Press.

Leslie, E., Owen, N., Salmon, J., Bauman, A., Sallis, J. F., & Lo, S. K. (1999). Insufficiently active Australian college students: Perceived personal, social, and environmental influences. *Preventive Medicine, 28,* 20-27.

Leslie, E., Sparling, P. B., & Owen, N. (2001). University campus settings and the promotion of physical activity in young adults: lessons from research in Australia and the USA. *Health Education, 101,* 116-125.

Licht, M. H. (1995). Multiple regression and correlation. In L. G. Grim & P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (pp. 19-64). Washington, DC: American Psychological Association.

Lichtenstein, E., Glasgow, R. E., & Abrams, D. (1986). Social support in smoking cessation: In search of effective interventions. *Behavioral Therapy, 17,* 607-619.

Moore, S. M. (1996). Women's views of cardiac rehabilitation programs. *Journal of Cardiopulmonary Rehabilitation, 16,* 123-129.

Morris, J. N. (1994). Exercise in the prevention of coronary heart disease: Today's best buy in public health. *Medicine and Science in Sports and Exercise, 26,* 807-814.

Nahas, M .V., Goldfine, B., & Collins, M. A. (2003). Determinants of physical activity in adolescents and young adults: The basis for high school and college physical education to promote active lifestyles. *The Physical Educator*, *60,* 42-56.

Nieman, D. C. (1998). *The exercise-health connection*. Champaign, IL: Human Kinetics.

Nunnally, J. C., & Bernstein, I. E. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Okun, M. A., Ruehlman, L., Karoly, P., Lutz, R., Fairholme, C., & Schaub, R. (2003). Social support and social norms: Do both contribute to predicting leisure-time exercise? *American Journal of Health Behavior, 27,* 493-507.

Pedhazur, E. J. (1997). *Multiple regression in behavioral research* (3rd ed.). Orlando, FL: Harcourt Brace College Publishers.

Plante, T. G., Bogdan, R., Kanani, Z., Babula, M., Ferlic, E., & MacAskill, E. (2003). Psychological benefits of exercising with another. *Journal of Human Movement Studies, 44,* 93-106.

Rhodes, R. E., Jones, L. W., & Courneya, K. S. (2002). Extending the theory of planned behavior in the exercise domain: a comparison of social support and subjective norm. *Research Quarterly for Exercise and Sport, 73,* 193-199.

Riemer, H. A., & Chelladurai, P. (1995). Leadership and satisfaction in athletes. *Journal of Sport & Exercise Psychology, 17,* 276-293.

Rook, K. S., & Underwood, L. G. (2000). Social support measurement and interventions: Comments and future directions. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 311-334). New York: Oxford University Press.

Rovniak, L .S., Anderson, E. S., Winett, R. A., & Stephens, R. S. (2002). Social-cognitive determinants of physical activity in young adults: A prospective structural equation analysis. *Annals of Behavioral Medicine, 24,* 149-156.

Sallis, J. F., & Owen, N. (1999). *Physical activity & behavioral medicine*. Thousand Oaks, CA: Sage Publications.

Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning points through life.* Cambridge, MA: Harvard University Press.

Sarason, I. G., Levine, H., Basham, R., & Sarason, B. R. (1983). Assessing social support: The Social Support Questionnaire. *Journal of Personality and Social Psychology, 44,* 127-139.

Sarason, B. R., & Sarason, I. G. (1994). Assessment of social support. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 41-63). New York: Plenum Press.

Sarason, B. R., Sarason, I. G., & Pierce, G. R. (1990). Traditional views of social support and their impact on assessment. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 9-25). New York: John Wiley & Sons, Inc.

Schachter, S. (1959). *The psychology of affiliation: Experimental studies of the sources of gregariousness.* Stanford, CA: Stanford University Press.

Schlenker, B. R., & Britt, T. W. (2001). Strategically controlling information to help friends: Effects of empathy and friendship strength on beneficial impression management. *Journal of Experimental Social Psychology, 37,* 357-372.

Schliesman, E. S. (1987). Relationship between the congruence of preferred and actual leader behavior and subordinate satisfaction with leadership. *Journal of Sport Behavior, 10,* 157-166.

Schutz, W.C. (1966). *The interpersonal underworld.* Palo Alto, CA: Science & Behavior Books.

Seefeldt, V., Malina, R. M., & Clark, M. A. (2002). Factors affecting levels of physical activity in adults. *Sports Medicine, 32,* 143-168.

Slentz, C. A., Duscha, B. D., Johnson, J. L., Ketchum, K., Aiken, L. B., Samsa, G. P., et al. (2004). Effects of the amount of exercise on body weight, body composition, and measures of central obesity – STRRIDE – A randomized controlled study. *Archives of Internal Medicine, 164*, 31-39.

Stahl, T., Rutten, A., Nutbeam, D., Bauman, A., Kannas, L., Abel, T., et al. (2001). The importance of the social environment for physically active lifestyle – results from an international study. *Social Science and Medicine, 52,* 1-10.

Steptoe, A., Wardle, J., Fuller, R., Holte, A., Justo, J., Sanderman, R., et al. (1997). Leisure-time physical exercise: Prevalence, attitudinal correlates, and behavioral correlates among young Europeans from 21 countries. *Preventive Medicine, 26,* 845-854.

Steptoe, A., Wardle, J., Pollard, T. M., Canaan, L., & Davies, G. J. (1996). Stress, social support and health-related behaviour: A study of smoking, alcohol consumption and physical exercise. *Journal of Psychosomatic Research, 41,* 171-180.

Streiner, D. L., & Norman, G. R. (1995). *Health measurement scales: A practical guide to their development and use* (2nd ed.). New York: Oxford University Press.

Stroebe, W. (2000). *Social psychology and health* (2nd ed.). Buckingham, GB: Open University Press.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins Publishers.

Tergerson, J. L., & King, K. A. (2002). Do perceived cues, benefits, and barriers to physical activity differ between male and female adolescents? *Journal of School Health*, *72,* 374-350.

Trout, D. L. (1980). The role of social isolation in suicide. *Suicide and Life-Threatening Behavior, 10,* 10-23.

Uchino, B. N., Cacioppa, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin, 119,* 488-531.

U. S. Department of Health and Human Services (2000). *Healthy people 2010: Understanding and improving health.* Washington, DC: U. S. Government Printing Office.

Vaux, A., Riedel, S., & Stewart, D. (1987). Modes of social support: The Social Support Behaviors (SS-B) Scale. *American Journal of Community Psychology, 15*, 209-237.

Vincent, W. J. (1999). *Statistics in Kinesiology* (*2nd Ed.*). Champaign, IL: Human Kinetics.

Wallace, L. S., Buckworth, J., Kirby, T. E., & Sherman, W. M. (2000). Characteristics of exercise behavior among college students: Application of social cognitive theory to predicting stage of change. *Preventive Medicine, 31,* 494-505.

Wallston, B., Alagna, S., DeVellis, B., & DeVellis, R. F. (1983). Social support and physical health. *Health Psychology, 2,* 367-391.

Wankel, L. M., Mummery, W. K., Stephens, T., & Craig, C. L. (1994). Prediction of physical activity intention from social psychological variables: Results from the Campbell's Survey of Well-Being. *Journal of Sport & Exercise Psychology, 16,* 56-69.

Watson, J. D., Spink, K. S., Wilson, K. S., Bruner, M. W., & Bostick, J. M. (October 2003). Social support in the group exercise setting: Testing the fit of Weiss's (1974) Model of Social Provisions. Paper presented at the Annual Meeting of the Canadian Society for the Psychology of Sport and Physical Activity, Hamilton, Ontario, Canada.

Weiss, R. (1974). The provisions of social relationships. In Z. Rubin (Ed.), *Doing unto others* (pp. 17-26). Englewood Cliffs, NJ: Prentice Hall.

Wills, T. A., & Filer Fegan, M. (2001). Social networks and social support. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 209-234). Mahwah, NJ: Lawrence Erlbaum Associates.

Wills, T. A., & Shinar, O. (2000). Measuring perceived and received social support. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 86-135). New York: Oxford University Press.

Winett, R. A., & Carpinelli, R. N. (2001). Potential health-related benefits of resistance training. *Preventive Medicine, 33,* 503-513.

Wright, R.E. (1997). Logistic regression. In L. Grim, & P. Yarnold (Eds.). *Reading and Understanding Multivariate Statistics* (pp. 217-244). Washington: American Psychological Association.

Zander, A. (1971). *Motives and Goals in Groups.* New York: Academic Press.

Appendix A

University of Saskatchewan
Research Project Consent Form
Social Provisions in the Exercise Setting Study

You are invited to participate in a study entitled "Social Provisions in the Exercise Setting". Please read this form carefully and feel free to ask any questions you may have.

Kevin S. Spink, Professor, College of Kinesiology, 966-1074
Jocelyn D. Watson, M.Sc. Student, College of Kinesiology, 966-1123

Purpose and Procedures
The purpose of this research study is to understand which types of social support participants feel are most important in the exercise setting.

If you volunteer to participate in this study, you will be asked to complete a questionnaire that asks questions about yourself and your exercise experiences. This questionnaire will take about 15 minutes to complete.

Potential Risks
Participation in this study presents no anticipated risks.

Potential Benefits
As a participant, you may be making important contributions to the research literature. We cannot and do not guarantee or promise that you will receive any direct benefits from the study.

Storage of Data
The original questionnaires will be safeguarded and securely stored in a locked filing cabinet at the University of Saskatchewan by K. Spink for a minimum of five years as per University requirements.

Confidentiality
Although the data from this study will be published and presented at conferences, the data will be reported in aggregate form, so that it will not be possible to identify individuals. Moreover, the consent forms will be stored separately from the questionnaire, so that it will not be possible to associate a name with any given information on the questionnaire. Please do not put your name or other identifying information on the questionnaire.

Right to Withdraw
Participation in this study is voluntary and you may withdraw from the study for any reason, at any time, without penalty of any sort. Any individual questions on the

questionnaire that you do not feel comfortable answering can be left blank. Neither the research supervisor nor the instructor will be present while you are completing the questionnaires, nor will they have access to the signed consent forms. Therefore, they will not know who has decided to participate and who has not, so that your decision to participate or withdraw cannot have any impact on your standing in the class or your final grade or your position within the College of Kinesiology. If you withdraw from the study at any time, any data that you have contributed will be destroyed.

Questions

If you have any questions concerning the study, please feel free to ask at any point. You are also free to contact either researcher at the numbers provided above if you have questions at a later time. The University of Saskatchewan Behavioral Sciences Research Ethics Board has approved this study on ethical grounds on March 3, 2004. Any questions regarding your rights as a participant may be addressed to that committee through the Office of Research Services (966-2084). At your request, a summary of the results of this study will be made to you following study completion.

If you have any questions about this study, please feel free to contact Dr. Kevin Spink at (306) 966-1074 or Jocelyn Watson at (306) 966-1123.

Consent to Participate

I have read and understood the description provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study described above, understanding that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records.

_____ _____

Signature of Participant Date

_____ _____

Signature of Researcher Date

Appendix B

Social Provisions in the Exercise Setting

J.D. Watson and Dr. K.S. Spink (College of Kinesiology)

AGE _____ **SEX: Male or Female (please circle)**

In this study, we are interested in understanding how your exercise behaviour might be influenced by those around you. For the purposes of this questionnaire, we are only interested in exercise behaviour, not simply physical activity. Physical activity includes any bodily movement that results in energy expenditure, whereas exercise is a form of physical activity in which there is a purpose – to gain health benefits or improve strength and/or cardiovascular endurance. Finally, as we are interested in exercise only, please do not include involvement in sports unless the main purpose for participation is for health benefits. If you are participating in sport for the sole purpose of skill improvement or competition, please do not include this.

Please read each question carefully and take time to read any instructions provided. Answer all questions as accurately and as honestly as possible. If you have any questions at all, please do not hesitate to ask. Enjoy!

PART A – Exercise Participation

Please complete the following table as it relates to your exercise involvement.

Aerobics	Dance (specify type)	Gymnastics	Football
Aquatics	Figure Skating	Speed Skating	Swimming-Laps
Badminton	Basketball	Rugby	Taebo
Wrestling	Lacrosse	Skipping	Tennis
Biking/Cycling	Pilates	Ringette	Volleyball
Cardio machine	Running/Jogging	Softball	Weight Lifting
Boxing	Wall Climbing	Skiing–X country	Walking
Spin class	Martial Arts/Kickbox	Skiing-Downhill	Training Club
Curling	Ice Hockey	Soccer	Other

1. Browse through the activities above and circle those that you have exercised in with others during the past 4 weeks only. Only include sports if a main reason for participation was for health benefits. Next, transfer these activities into the first column of Table 1 below. If any activities are not listed above, please add them yourself.

2. Record in the second set of columns, the number of times you exercised in that activity during each week.

3. In the third column, record the average (not total) number of minutes you were *actually exercising* each time (do not include time spent changing clothes, stretching, standing around, etc).

4. In the last column, record the average intensity in which you exercised: Light (slight change from normal breathing), Moderate (above normal breathing), or Heavy (heavy breathing).

5. Answer the question below the table regarding the exercise participation you recorded.

Activity	**Number of Times Exercising Each Week**				**Average Number of Minutes You Were Actually Exercising Each Time**	**Intensity** L = Light M = Moderate H = Heavy
	4 Weeks Ago	**3 Weeks Ago**	**2 Weeks Ago**	**Last Week**		

PART B – Your exercise preferences

Instructions:
This set of questions requires you to think about your exercise preferences while exercising with others. Please indicate the extent to which you agree with each statement using the following scale:

strongly disagree	disagree	agree	strongly agree
1	2	3	4

If you feel a statement is true of your preferences of exercising with others, you would respond, "strongly agree", and circle the number "4". If you feel a statement clearly does not describe your preferences, you would respond, "strongly disagree", and circle the number "1".

---

1. When I exercise with others, I prefer to have people I can depend on to help me if I really need it.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

2. When I exercise with others, I prefer to have close relationships with other people.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

3. When I exercise with others, I prefer to have someone I can turn to for guidance in times of stress.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

4. When I exercise with others, I prefer to have people who depend on me for help.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

5. When I exercise with others, I prefer to have people who enjoy the same social activities I do.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

6. When I exercise with others, I prefer to have other people who view me as competent.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

7. When I exercise with others, I prefer to feel personally responsible for the well-being of another person.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

8. When I exercise with others, I prefer to feel part of a group of people who share my attitudes and beliefs.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

9. When I exercise with others, I prefer to have other people who respect my skills and abilities.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

10. When I exercise with others, I prefer to know that, if something went wrong, someone would come to my assistance.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

11. When I exercise with others, I prefer to have close relationships that provide me with a sense of emotional security and well-being.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

12. When I exercise with others, I prefer to have someone who I could talk to about important decisions in my life.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

13. When I exercise with others, I prefer to have my competence and skill recognized.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

14. When I exercise with others, I prefer to have someone who shares my interests and concerns.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

15. When I exercise with others, I prefer to have someone who really relies on me for his/her well-being.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

16. When I exercise with others, I prefer to have a trustworthy person I could turn to for advice if I were having problems.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

17. When I exercise with others, I prefer to feel a strong emotional bond with at least one other person.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

18. When I exercise with others, I prefer to have someone I can depend on for aid if I really need it.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

19. When I exercise with others, I prefer to have someone I feel comfortable talking about problems with.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

20. When I exercise with others, I prefer to have people who admire my talents and abilities.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

21. When I exercise with others, I prefer to feel intimacy with another person.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

22. When I exercise with others, I prefer to have someone who likes to do the things I do.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

23. When I exercise with others, I prefer to have people I can count on in an emergency.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

24. When I exercise with others, I prefer to have someone who needs me to care for them.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

PART C – Your exercise experiences

Instructions:
This set of questions requires you to think about your exercise experiences in the last 4 weeks. Please indicate the extent to which you agree that each statement describes your current relationships with other individuals in your exercise environment.

1. While I was exercising with others during the last month, there were people I could depend on to help me if I really needed it when I exercised.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

2. While I was exercising with others during the last month, I feel that I had close personal relationships with other people .

strongly disagree	disagree	agree	strongly agree
1	2	3	4

3. While I was exercising with others during the last month, there was someone I could turn to for guidance in times of stress.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

4. While I was exercising with others during the last month, there were people who depended on me for help.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

5. While I was exercising with others during the last month, there were people who enjoyed the same social activities I do.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

6. While I was exercising with others during the last month, other people viewed me as competent.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

7. While I was exercising with others during the last month, I felt personally responsible for the well-being of another person.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

8. While I was exercising with others during the last month, I felt part of a group of people who share my attitudes and beliefs.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

9. While I was exercising with others during the last month, I think other people respected my skills and abilities.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

10. While I was exercising with others during the last month, if something went wrong, someone would have come to my assistance.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

11. While I was exercising with others during the last month, I had close relationships that provided me with a sense of emotional security and well-being.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

12. While I was exercising with others during the last month, there was someone I could talk to about important decisions in my life.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

13. While I was exercising with others during the last month, my competence and skill were recognized.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

14. While I was exercising with others during the last month, there was someone who shared my interests and concerns.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

15. While I was exercising with others during the last month, there was someone who really relied on me for his/her well-being.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

16. While I was exercising with others during the last month, there was a trustworthy person I could turn to for advice if I was having problems.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

17. While I was exercising with others during the last month, I felt a strong emotional bond with at least one other person.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

18. While I was exercising with others during the last month, there was someone I could depend on for aid if I really needed it.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

19. While I was exercising with others during the last month, there was someone I felt comfortable talking about problems with.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

20. While I was exercising with others during the last month, there were people who admired my talents and abilities.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

21. While I was exercising with others during the last month, I felt intimacy with another person.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

22. While I was exercising with others during the last month, there was someone who liked to do the things I do.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

23. While I was exercising with others during the last month, there were people I could count on in an emergency.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

24. While I was exercising with others during the last month, someone needed me to care for them.

strongly disagree	disagree	agree	strongly agree
1	2	3	4

Appendix C

UNIVERSITY OF SASKATCHEWAN
BEHAVIOURAL RESEARCH ETHICS BOARD
http://www.usask.ca/research/ethics.shtml

NAME: Kevin Spink (Jocelyn Walsh) Beh 04-13
College of Kinesiology

DATE: March 3, 2004

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the Application for Ethics Approval for your study "Social Provisions in Cardiac Rehabilitation" (Beh 04-13).

1. Your study has been APPROVED.

2. Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Committee consideration in advance of its implementation.

3. The term of this approval is for 5 years.

4. This approval is valid for one year. A status report form must be submitted annually to the Chair of the Committee in order to extend approval. This certificate will automatically be invalidated if a status report form is not received within one month of the anniversary date. Please refer to the website for further instructions http://www.usask.ca/research/behavrsc.shtml

I wish you a successful and informative study.

Dr. David Hay, Acting Chair
University of Saskatchewan
Behavioural Research Ethics Board

DH/ck

Office of Research Services, University of Saskatchewan
Room 1607, 110 Gymnasium Place, Box 5000 RPO University, Saskatoon SK S7N 4J8 CANADA
Telephone: (306) 966-8576 Facsimile: (306) 966-8597
http://www.usask.ca/research

Appendix D

Factor Loadings for the Perceived Provisions

Item #	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1	.149	.696	.240	-.016	-.014
2	.505	.329	.455	.237	.056
3	.408	.582	.370	.241	-.013
4	.047	.211	.304	.723	.076
5	.125	.216	.790	.082	.102
6	.039	.083	.259	.088	.702
7	.166	.043	.056	.812	.194
8	.177	.088	.678	.127	.317
9	.079	.103	.156	.106	.826
10	.108	.774	-.072	.046	.220
11	.752	.233	.089	.166	.137
12	.661	.342	.365	.242	.107
13	.105	.132	.100	.101	.808
14	.314	.259	.711	.142	.223
15	.214	-.054	.107	.857	.071
16	.631	.465	.268	.163	.068
17	.758	.174	.266	.166	.190
18	.214	.762	.261	.059	.068
19	.663	.368	.360	.170	.072
20	.203	-.058	.082	.162	.767
21	.780	.025	.066	.146	.111
22	.294	.215	.705	.065	.211
23	.224	.730	.218	-.039	.036
24	.260	-.13	-.012	.734	.151

Appendix E

Factor Loadings for the Preferred Provisions

Item #	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1	.087	.317	.549	-.049	.266	-.038
2	.278	.586	.284	-.155	.177	-.012
3	.492	.283	.462	-.147	.163	-.056
4	.336	.202	.346	-.102	.535	-.238
5	.085	.697	.106	.128	.094	-.061
6	-.061	.339	.400	.506	-.023	-.018
7	.026	-.037	.002	.265	.766	.066
8	.173	.676	.017	.262	.085	-.013
9	.108	.361	.153	.644	.057	-.340
10	.090	.014	.691	.228	-.002	-.085
11	.535	.355	.202	-.012	.129	.225
12	.751	.072	.120	.159	.093	.177
13	.123	.146	.062	.820	.098	.082
14	.317	.590	.040	.231	.041	.052
15	.179	.145	.016	.057	.786	-.001
16	.781	.114	.265	.105	.074	-.141
17	.663	.247	.038	.102	.303	.189
18	.297	.000	.782	.016	.034	.156
19	.817	.103	.174	.085	.164	.095
20	.130	.074	-.073	.735	.228	.164
21	.307	.026	.140	.036	.187	.777
22	-.047	.639	.127	.277	-.127	.439
23	.205	.140	.743	.028	-.046	.215
24	.305	.072	.056	.084	.627	.321